Volume XXV.
Number 5.

AUGUST, 1903.

$2.00 per year.
$3.00 with Directory.

TEXTILE WORLD RECORD

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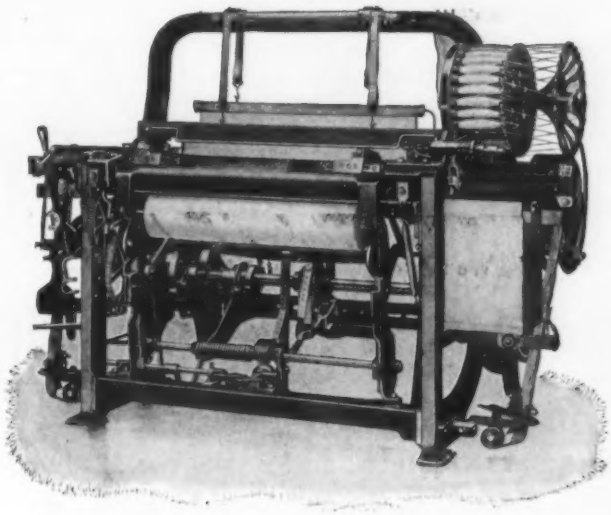

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NORTHROP LOOM

ALTHOUGH our order list lengthens and strengthens, we do not adopt the simple and inexpensive plan of building without change, but continually add improvements whenever possible. A careful study of the above illustration will prove of interest to adepts in the Art of Weaving.

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We beg to inform the trade that our

Automatic Shuttle and Loom Attachment

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10. As the loom stops less frequently, its operation is more regular, consequently producing *better* goods and also keeping the *looms in better condition.*

The superiority of our Automatic Shuttle and Loom Attachment over all existing similar devices is its simplicity and the fact that it absolutely leaves no mispicks whatsoever, which has been a cause of surprise and admiration to all experts who have seen our Attachment in operation.

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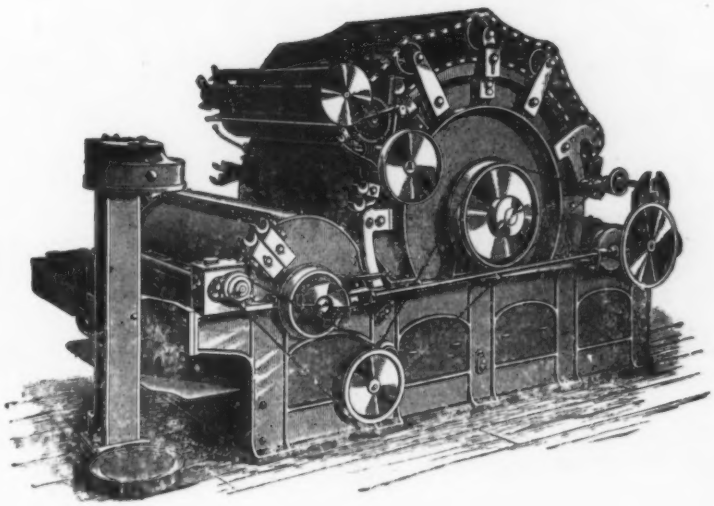

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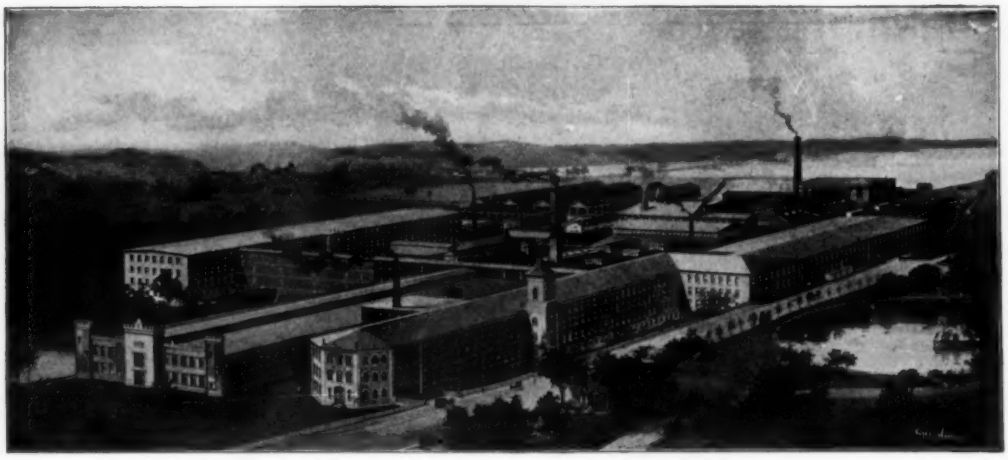

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Looms,
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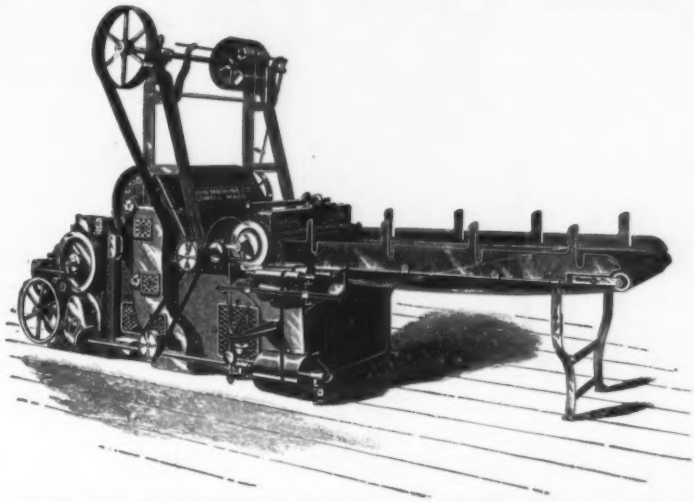

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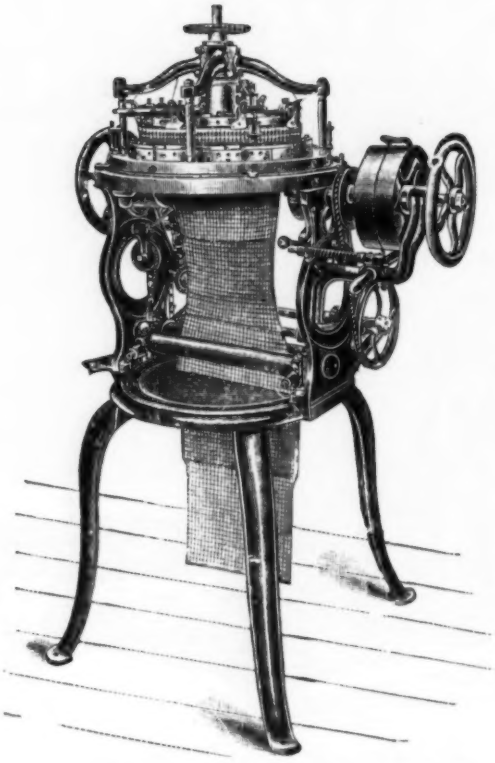

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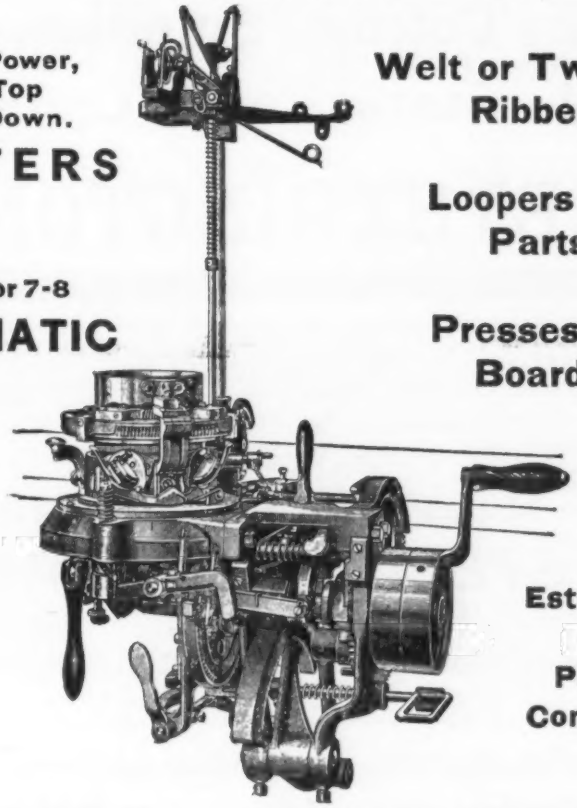

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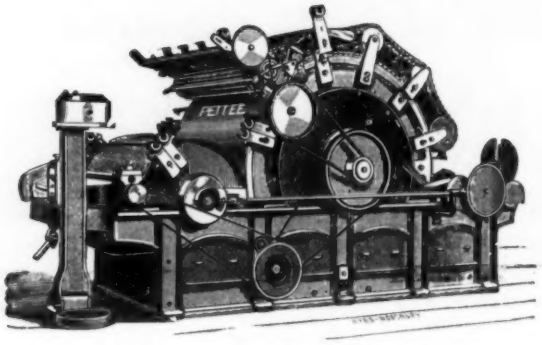

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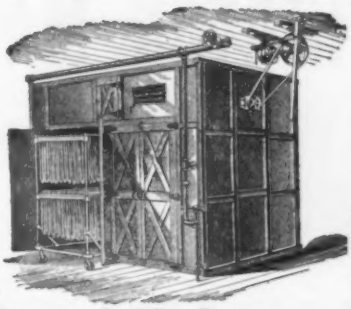

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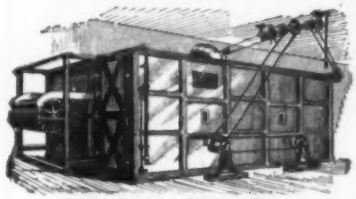

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7 1-2 CENTS PER SPINDLE.

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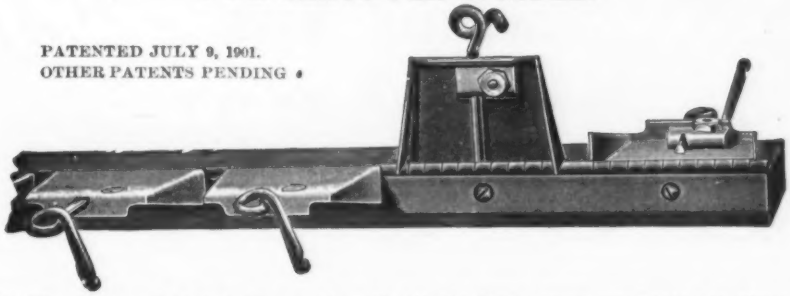

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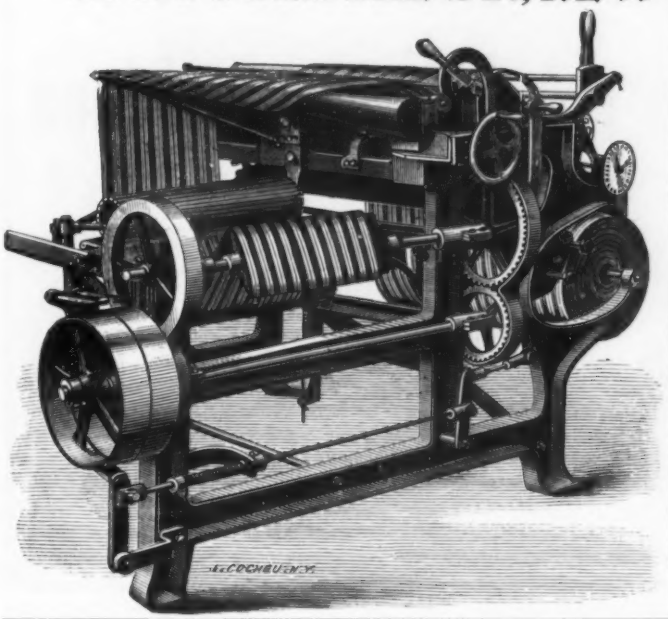

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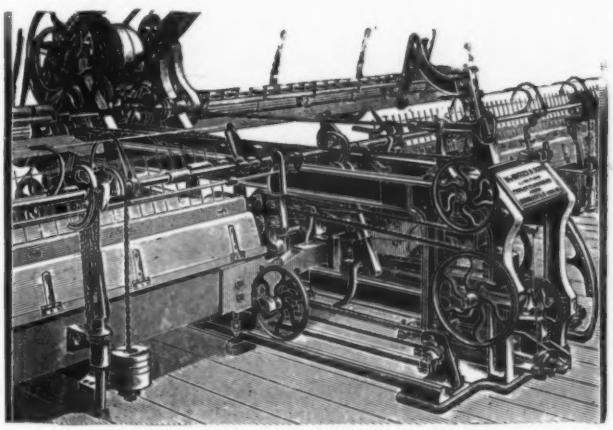

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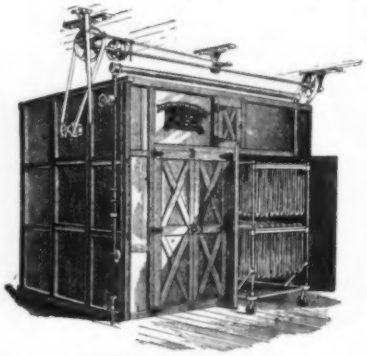

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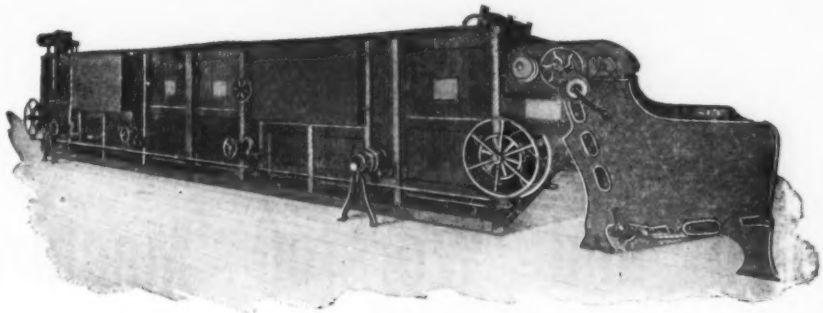

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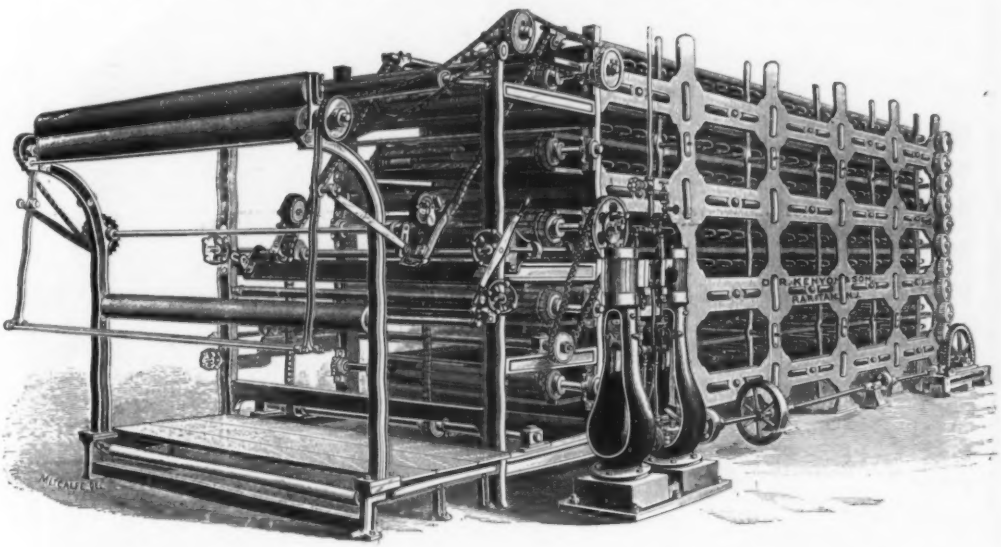

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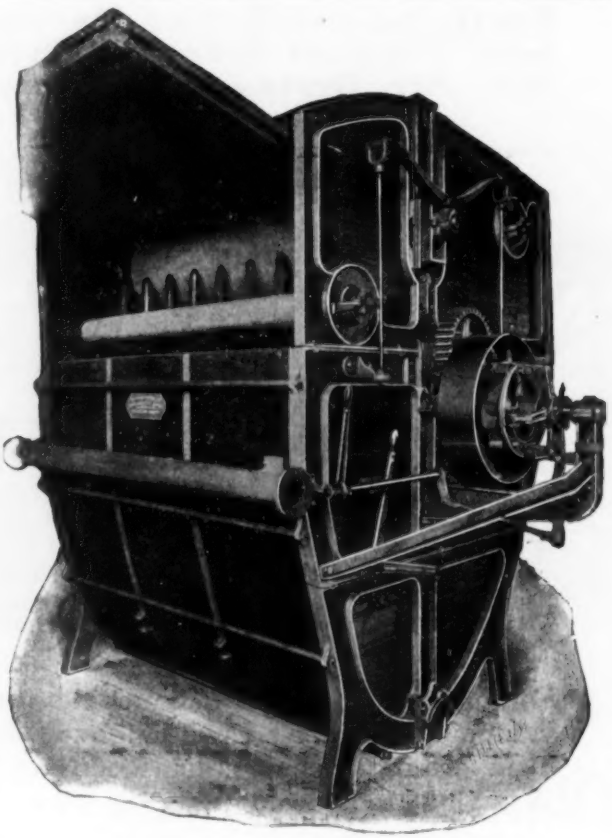
Rotary Knit Goods Washers.
Combined Fulling Mill
and Washer for Knit Goods.
Hammer Falling Stocks.
Dolly Washers.
Crank Fulling Mills.
Crank Knit Goods Washers.
Hydro-Extractors.
Reel Dyeing Machines.
Carbonizing Machines.
Bleaching Machines.
Dye Tubs and Rinsers.
Wool Washers.
Soaping Machines.
Cloth Winders.

New Rotary Cloth Washer



Type C. For All Fabrics.

Improved Attachments for Fulling and Washing Knit Goods in the roll. Is fully described in Circular No. 10.

Boston Office,
70 KILBY STREET,
Telephone No. 1522.

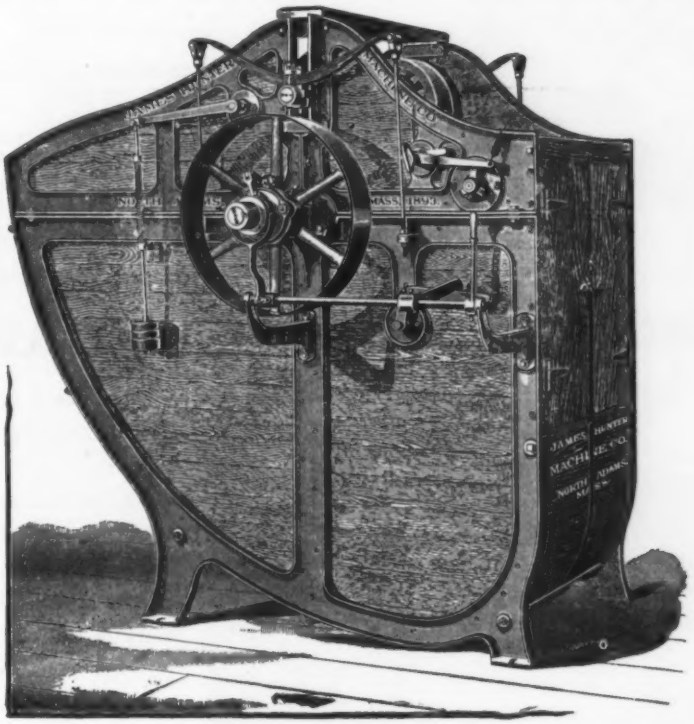
Main Office and Works,
ORANGE, MASS.

Automatic Wool Washers

PARALLEL RAKE

The "STONE DRYER," for Wool, Cotton, Rags, Etc.

CARBONIZING MACHINERY, ETC.



Fulling Mills, Cloth Washers,

WOOL OPENERS, SELF FEEDS, DUSTERS

JAMES HUNTER MACHINE COMPANY, NORTH ADAMS, MASS.

You Want the Best. We Build Them.

CLOTH WASHERS, FULLING MILLS,

1901 FULLING MILL.

Piece Dyeing Machines,
Dye Tubs, Vats,
Tanks, etc.

HOPKINS MACHINE WORKS

Providence and Bridgeton, R. I.

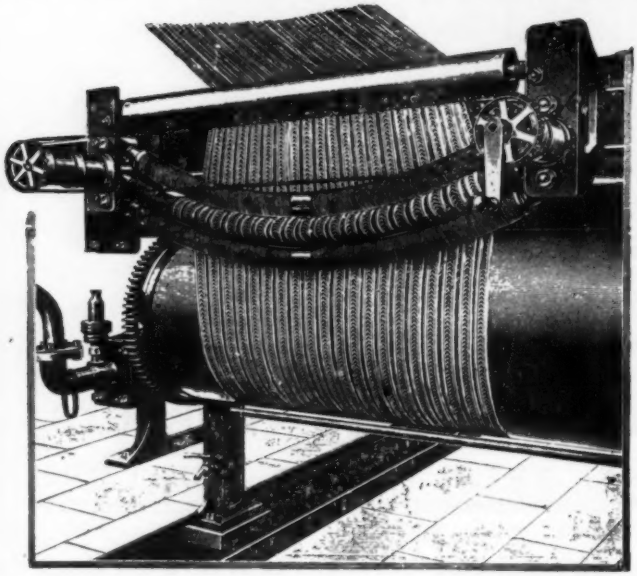
PROVIDENCE OFFICE

49 Westminster Street.

Our Machines are up to date.
Patented features found in no others.
Most effective and economical machines built.

Send for Catalog, Prices, and also ask about our Fulling Mill for extra heavy goods and blankets.

A PERFECT CLOTH EXPANDER



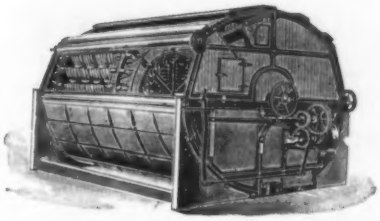
The recent invention of Wm. Mycock, an English cotton manufacturer. Hundreds sold in Great Britian and on the Continent. Large bleacheries in this country where it has been placed on trial are delighted with it. Gets the full width of goods, with perfectly even tension both ways. Can be attached to calenders or cans. Put it on trial.

Patented in United States, Canada, Great Britain and Continental countries. Infringements will be prosecuted.

THOMAS LEYLAND & CO., 53 INDIA ST., BOSTON.

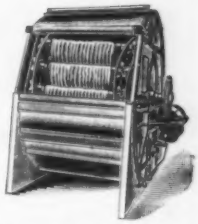
Sole Agents for the United States and Canada.

SKEIN AND SLUBBING MACHINES.



SAVES
75 per cent in Labor,
30 per cent in Winding,
Steam and Dye Stuffs,
Perfectly Even Dyeing.

CAPACITY:
50 to 700 pounds per batch.



No Friction on the Skeins. No Tangling of the Yarn.

Universally Used.

J. H. A. KLAUDER, Pres. and Gen'l Manager. **J. H. GILES, Treasurer.**
E. HEPPENSTALL, Huddersfield, Eng.

THE KLAUDER-WELDON
DYEING MACHINE CO.,
AMSTERDAM, N. Y.

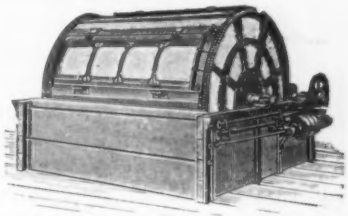
BUILDERS OF MACHINERY FOR DYEING, BLEACHING AND MERCERIZING.

For Skein — Worsted, Slubbing, Cotton and Silk.
" Raw Stock — Cotton, Wool, Waste and Slubbing.
" Garments — Underwear, Hosiery, Hats and Caps.
" Sulphur Colors — Skein, Raw Stock and Hosiery.
" Skein and Warp Mercerizing.

RAW WOOL AND COTTON MACHINES.

SAVES
50 per cent in Labor,
besides Steam and Dye Stuffs.
Practically Indestructible.

CAPACITY:
200 to 1000 lbs. per batch.



Leaves Stock in Perfect Condition. Does Not Mat or Tangle the Fibre.

A Perfect Machine.

OSWALD LEVER

Formerly LEVER & GRUNDY

Builders of Textile Machinery

FILLING COP WINDING MACHINES. Spindles driven by belts or by gears, and bobbins can be made to wind any kind of filling from the coarsest to finest numbers, from Skeins, Spools, Cones, Mule Cops, or any other Spinning or Twister Bobbins. These machines can be arranged to wind cops or butts from the largest used in weaving to the smallest cops or butts for cotton filling used in the silk trade.

OUR MACHINERY PUTS YARN IN CONDITION FOR MANUFACTURING AS SHOWN ABOVE.

BANDLESS SPINDLE SPOOLING MACHINES; adapted to the finer grades of yarn and to the finest silk. ***PRESSER DRUM SPOOLING MACHINES;*** arranged to spool in any way the trade requires. ***BANDLESS VARIABLE SPEED MACHINES;*** to wind the large bobbins used in knitting mills. ***CONICAL AND STRAIGHT TUBE WINDING MACHINES; BRASS BOBBIN WINDING, SPOOLING, WARPING*** and other machinery for lace mills. Beaming Machines, Sectional Warp Mills, Chenille Cutting Machines, etc., etc.

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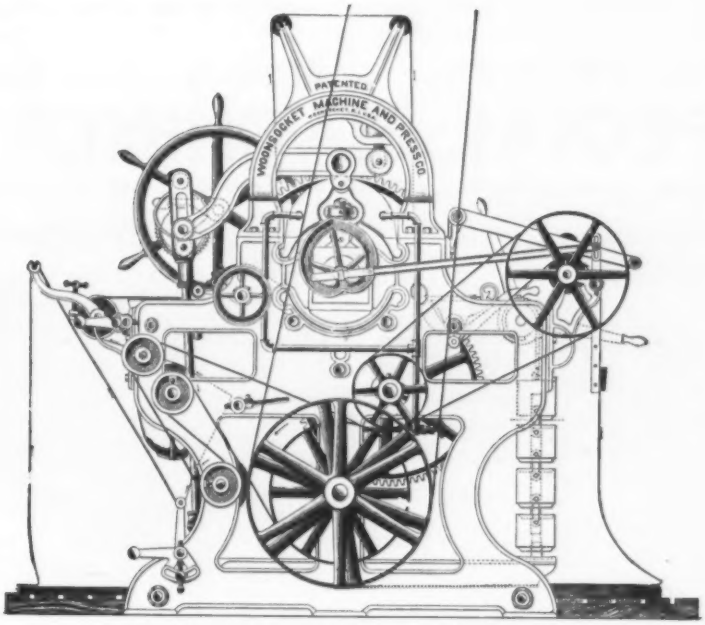
Best Patent Steam Rotary Cloth Press

Four Separate Pressings In One Machine!

The Only Press that has Self-Yielding Beds with Four Points of Contact

PERFECT TEMPERATURE, POWERFUL, SIMPLE



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Woonsocket Machine and Press Company

WOONSOCKET, R. I,

WM. FIRTH, Pres. EDWIN BARNES, Vice-Pres. JOHN H. NELSON, Treas.

WILLIAM FIRTH CO.

67 Equitable Building, 150 Devonshire Street, BOSTON, MASS.

. . . SOLE IMPORTERS OF . . .

ASA LEES & CO., Limited,

TEXTILE MACHINERY,

OF EVERY DESCRIPTION FOR COTTON, WOOLEN AND WORSTED.

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JAMES MACKIE & SONS, LTD., Makers of Flax, Tow, Hemp and Jute Preparing and Spinning Machinery.
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LOCKETT, CROSSLAND & CO., Engravers and Builders of Leather Embossing Machinery, etc., etc.
R. CENTNER FILS, Heddles.
GOODBRAND & CO., Yarn Testing Machinery, Wrap Reels, etc.
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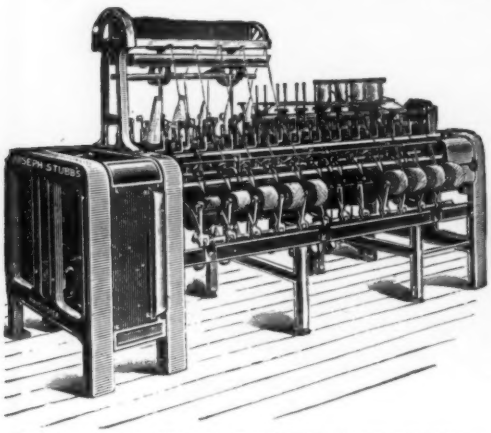
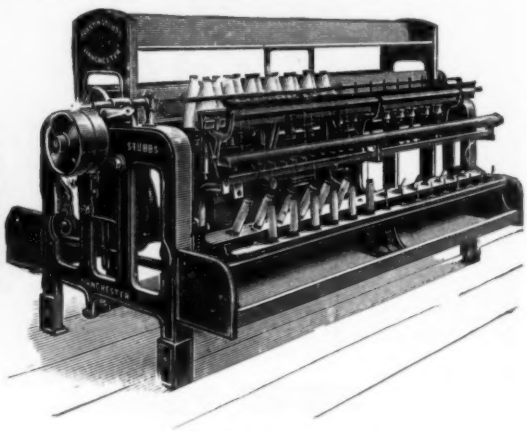
JOSEPH STUBBS, . . Manchester, England,

SPECIAL MACHINERY,

For Winding Gassing, Reeling, Preparing, Polishing and Bundling Yarns.



PATENT QUICK TRAVERSE COTTON GASSING FRAME.



IMPROVED RABBETH SPINDLE WINDER.
With Patent Tapering Motion, for Single Flanged Bobbins.

Sole Agents for the United States and Canada:

WILLIAM FIRTH COMPANY, 67 Equitable Buildings, 150 Devonshire Street, BOSTON, MASS.

Pulley and Gear Forcer.

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Equitable Bldg., Boston, Mass.

Received the HIGHEST AWARD on recomendation of the FRANKLIN INSTITUTE for

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The Only Perfect System of Air Moistening

And Has Been Adopted by the Representative Manufacturers of this Country.

The only System adopted in the Textile Schools. Write for Booklet "T" on Humidification. Legal Proceedings will at once be taken against infringers and users of infringements.

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OF EVERY KIND AND DESCRIPTION

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Allentown Reed, Harness and Mill Supply Co.
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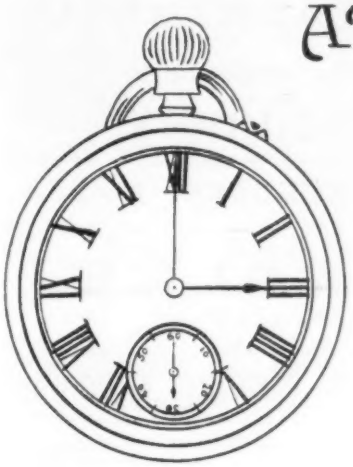
Deliveries always on Time



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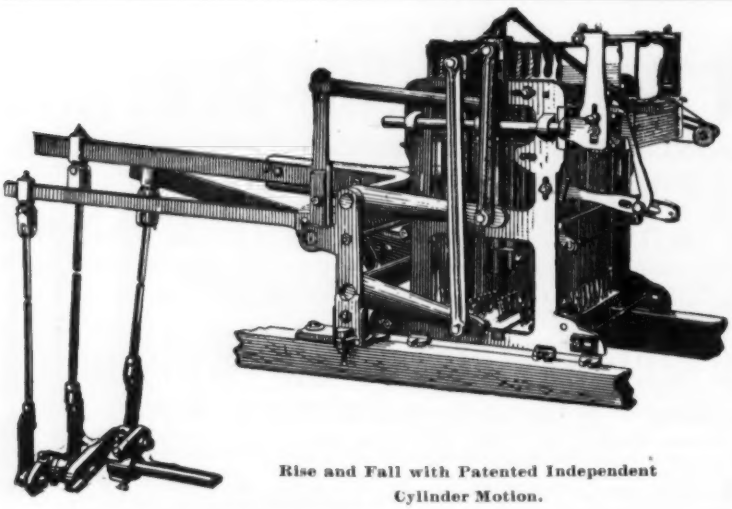

Rise and Fall with Patented Independent Cylinder Motion.

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HALTON JACQUARD

"The Best Machine on the Market"

Original Fine Index Machines

Single Lift, Double Lift, Double Cylinder, Rise and Fall, Crossborder.

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Allegheny Avenue and C Streets,

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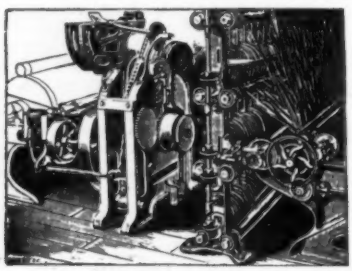

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HARRISON, N. J.

TORRANCE PATENT **AUTOMATIC BALLING MACHINE**

With all the latest improvements for Wool Cards. The latest and best and only Feed that will make yarn positively even.

ALSO

CHOQUETTE WASTE SAVER. Saves card fly.

Write for particulars.

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MANUFACTURERS OF

Wool Burring, Picking and Mixing Machinery

Cloth Finishing Machinery

For Cotton, Woolen, Worsted, Plush Goods, Etc. Shearing Machines a Specialty.

New Works, 56 Cambridge St., near Webster Sq.
Send for Descriptive Catalogue.

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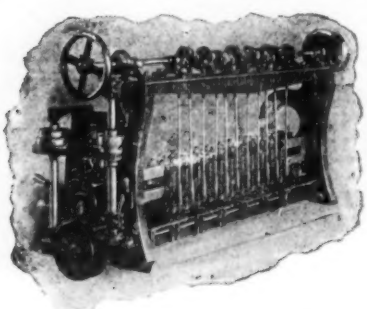

Standard Horse Blanket Machine.

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Manufacturer and Builder of

Multiple Needle Sewing Machines,

For Sewing Carpet Lining, Horse Blankets, Wadding, etc.

These machines can be built with any required number of needles.

SPECIAL MACHINERY DESIGNED AND BUILT.

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The Metallic Drawing Roll Co.

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Metallic Rolls

Especially adapted for Cotton Mills. 25 to 33 per cent more Production Guaranteed. Weight Reduced 33 to 50 per cent. No Leather Covering Bill.

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Sew any fabric, wet or dry, thin or thick, fine stitch or coarse stitch.

Send for new circular telling how to get perfect work in this department.

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Successor to THOMAS RAMSDEN,

Maker of

Worsted Machinery,

For Preparing, Finishing Gills and Drawing Boxes

New Screws made and old ones repaired and thoroughly case-hardened

Repairs and new parts for curled hair machinery. Fallers of every description made. Change Gears, 5-8, 7-16, 3-8 and 1-4 inch pitch kept on hand. All kinds of new Fluted Rollers, for Combs, Gills, Drawing and Spinning; also Refluting old ones. Improved Roller Covering Machine.

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FRANK B. KENNEY, Manager.

T. C. ENTWISTLE COMPANY,

MANUFACTURERS OF

Patent Warping, Balling, Beaming and Long Chain Dyeing

MACHINERY

And All Kinds of Expansion Combs, for Warpers, Beamers, and Slashers.

ALSO TRAVERSE WHEEL AND ROLL GRINDERS

for American or English Cotton, Woolen or Worsted Cards.

Particular attention given to the Repairing of Grinders of all makes for Cotton Woolen or Worsted Cards.

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ESTABLISHED 1834. E. A. BURNHAM, Propr.

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PAWTUCKET, ... R. I.

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Cloth Stretchers

Thread and Yarn Reels
Improved Thread Dressers

Yarn Printing Machines for Warp or Skein, Belt Cutters, Scarfing Machines.

G. L. BROWNELL,

BUILDER OF

IMPROVED SPINNING

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TWISTING MACHINERY

FOR HARD OR SOFT TWINES, LINES, CORDAGE, ETC.

Of Sisal, Manila, Cotton. Linen, Hemp, Jute, Silk, Hair, Paper, or Wire.

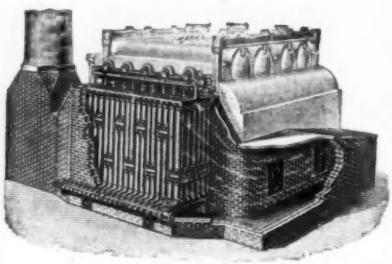
Write for particulars in regard to our new machine for spinning heavy Cotton Yarn direct from Drawing Sliver for Cotton Rope, etc.

49 and 51 Union St., Worcester, Mass.

THOUGHTFUL CONSIDERATION

on the part of the Engineer, makes great economies in the running of a Plant, particularly if assisted by a

Green's Economizer



which is the greatest assistant to true economy yet produced. The gain in steam, with the corresponding reduction of fuel, seems incredible, but with our Economizer you can easily save from 10 to 20% in Fuel, and yet, through the use of waste gasses entirely, keep the feed-water heated above the boiling point. What this means to the **Textile Mill, Bleacheries** and **Dyehouses,** is best ascertained through the testimonials of those having one in their boiler room. Our booklet, sent free, shows not only how it is done, but gives you a list of users, and their testimonies as to the value to them. Our great advantage—applied without stoppage to works Write us for plans and specifications.

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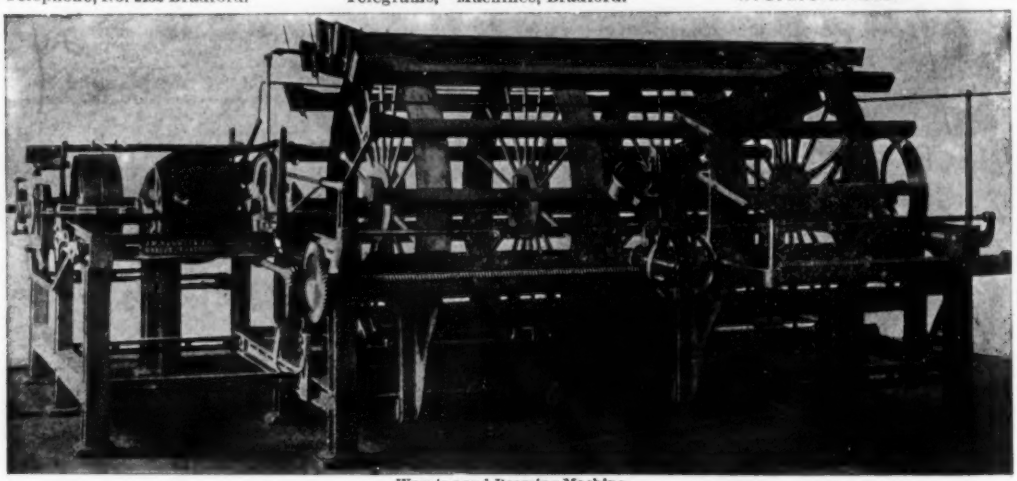
Telephone, No. 2132 Bradford. Telegrams, "Machines, Bradford." W. U. T. Code used.



Warping and Beaming Machine.

SPECIALTIES: Dyeing and Finishing Machinery. Tentering and Drying Machines. Wet Finishing Machines. Mangles. Calenders. Warp and Hank Dyeing Machines. Hank, Warp and Piece Mercerizing and Lustring Machinery. Yarn Finishing Machinery. Patent Sectional Warping and Beaming Machine.

Estimates and Plans prepared for complete Piece or Warp Bleaching, Dyeing and Finishing Works.

Before—Not After

See the Point?

WE ARE NOT Insurance Adjusters neither are we appraisers AFTER the fire. We appraise your property while it is still intact and before a fire occurs.

WE SHOW YOU what it would cost to replace your property at PRESENT DAY prices and thus enable you to place your insurance intelligently.

WE ALSO SHOW you what the actual depreciation on your property is. This is very different from THEORETICAL depreciation and will repay investigation.

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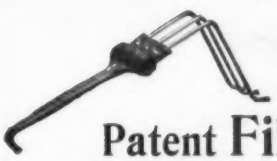
THE CLEGG WEFT FORK CO.



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Patent Filling Fork

AND DOBBY SPRINGS

Solid Socket, Can't Work Loose. Best of Steel Wire, Well Balanced. Wires Cannot Work Loose or Come Out. Send for sample.

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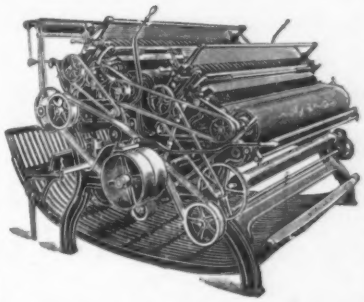
SHEARS for finishing Cotton, Wool or Worsted Fabrics made in single sets or in several sets to finish face and back at one feed, saving space, time, cost. The Combined Shear and Roller for Carpets is an example. Baling and Finishing Presses for Straw, Felt and Buckram Hats. Shafting, Gearing. We grind or repair all makes of Shears. HOWARD FOUNDRY & MACH. W'K S, Landsdowne, Delaware Co., Pa.

DOUBLE SHEAR



The Finest Shearing Machine in the World. Get into line. Use Double Shears. We will take your Single Shears in trade. Our representative can interest you. He will call at a word from you.

Parks & Woolson Machine Co. Springfield, Vermont.

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Mill Sewing Machines

No. 9—Portable Foot-Power Rotary Sewing Machine.

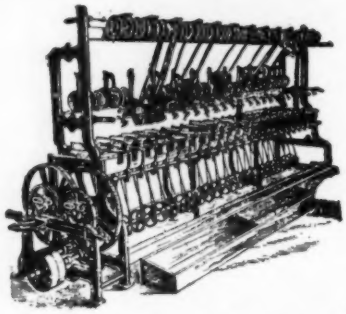
It is especially adapted for use in Cotton and Woollen Mills, Bleacheries, Print Works at the Printing Machines, in Dye Works, Cloth Rooms, at the Fulling Mill, Shears, Calendars, Gigs, Drying Machines, etc., or any of the different finishing processes in textile mills.

Manufactured by the

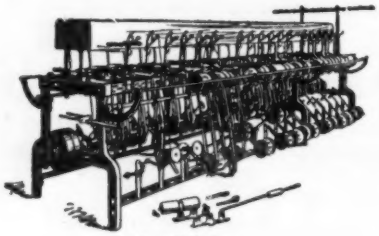
DINSMORE MANUFACTURING CO.,

Salem, Mass., U. S. A.

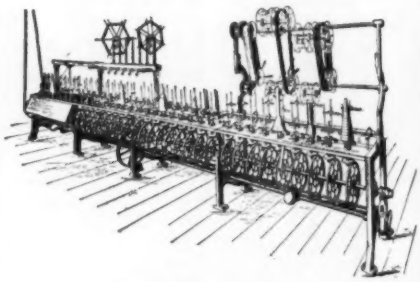
SPOOLING, WINDING, WARPING & BEAMING MACHINERY



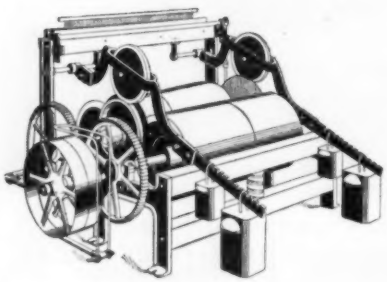
Shuttle Bobbin Winder with Variable Motion.



Cop Winder.



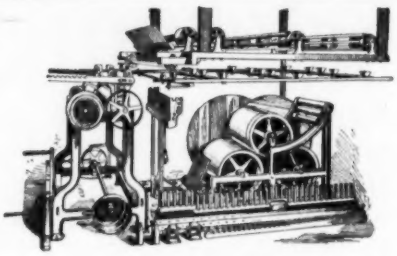
Hosiery Bobbin Winder.



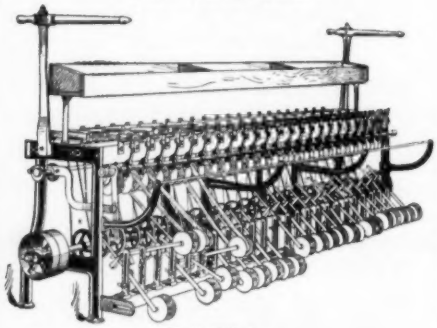
Compress Beamer.

JACOB K. ALTEMUS, 2818 NORTH 4th ST., PHILADELPHIA, PA.

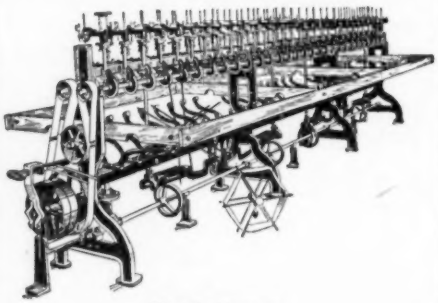
FULL PARTICULARS ON APPLICATION.



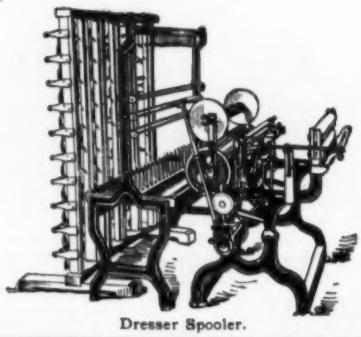
12 Space Warp Splitter.



Butt Winder.



Upright Spooler.



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THE BEST SYSTEM IN THE WORLD FOR WINDING FIBRE AND WIRE.

NO KINKING.
NO WASTE.
NO VARIATION IN TENSION WHILE UNWINDING.
NO REWINDING REQUIRED.

"UNIVERSAL"

The Best Winding Machine in the World.

High Speed, Great Durability, Interchangeable Parts, Perfect Tension, Easy to Operate.

UNIVERSAL WINDING COMPANY

95 SOUTH STREET, BOSTON.

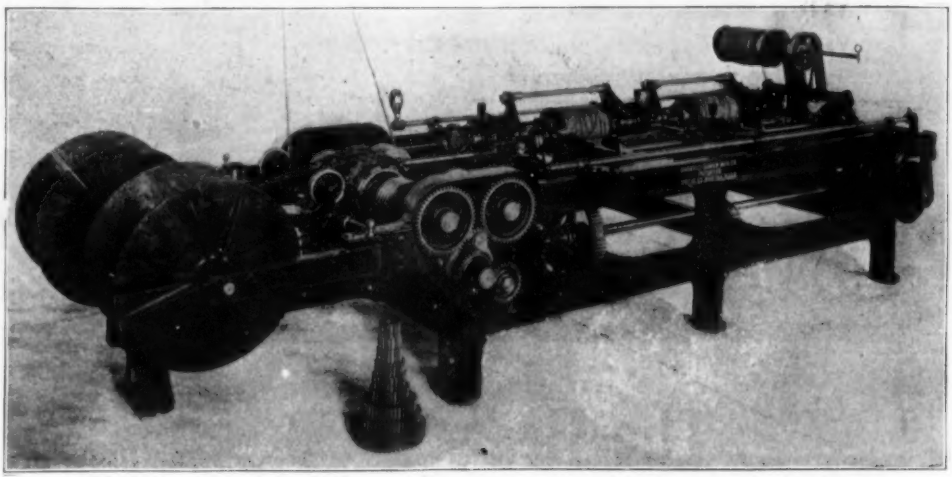
THE HASKELL-DAWES MACHINE CO.

Manufacturers of the best types of

Forming, Twisting and Laying Machinery

Which are adapted for making all kinds of

COTTON CABLE-LAID TWINE, CORD and ROPE



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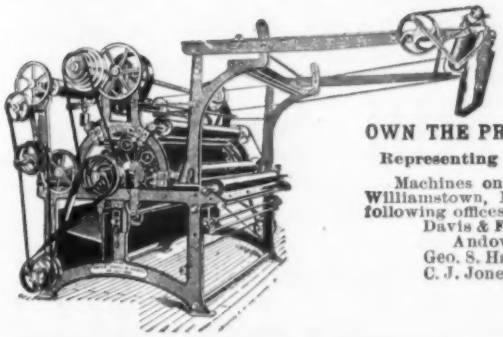

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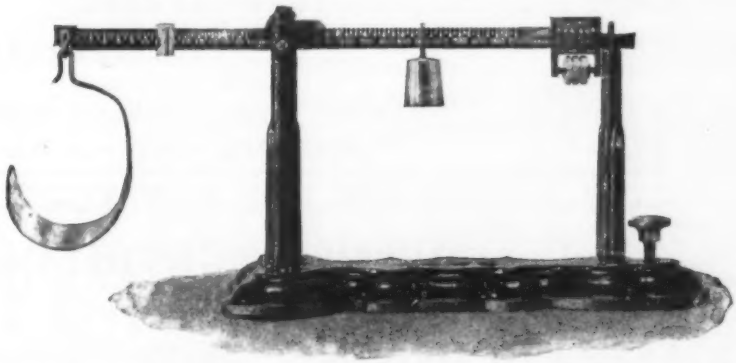

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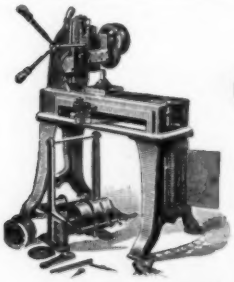

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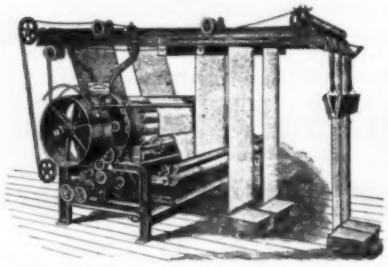

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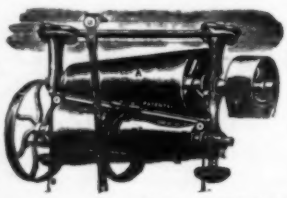

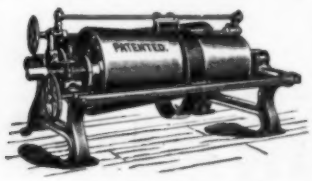

Smith & Winchester Co., So. Windham, Conn., 260 sets. Furguson & McRae, Belfast, Ireland, 25 sets. Mercantile Laundry, So. Windham, Conn., 250 sets. Washburn & Moen, Worcester, Mass., large number, all sizes. Dennison Tag Co., Boston, Mass., large number, small sizes. Sacco & Pettee Machine Co., Newton, Mass., 375 sets. Pacific Mills, Lawrence, Mass., 13 sets.

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TRUCKS and BOXES.

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Napping, Shearing and other Machinery

For Finishing Woolen, Worsted, Cotton, Knit Goods, Blankets, etc.
Greene Nappers. **French Nappers.**
Shearing Machines a Specialty.
Special attention paid to Repairing all kinds of Shear Rests and to Repairing and Grinding of all kinds of Shear Blades.

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SUCCESSORS TO CYRUS BORGNER
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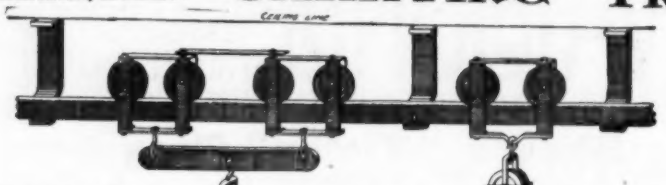
OVERHEAD CARRYING TRACK.



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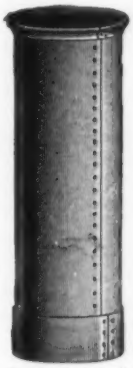

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Seamless Manilla
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HARD & FLEXIBLE FIBRE : : : :
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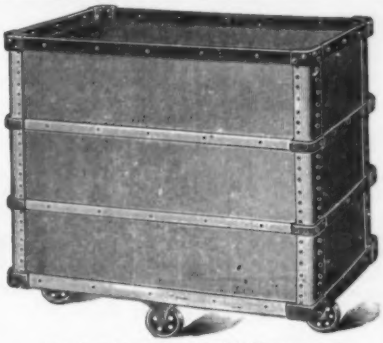
The "20th Century" Laminar Can.

Laminar Taper Box with hardwood shoes. Top View.



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Laminar Taper Box with hardwood shoes. Bottom View.

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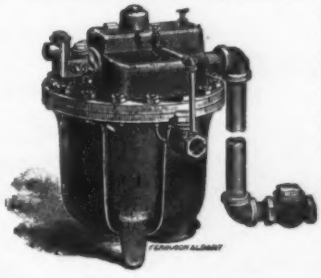

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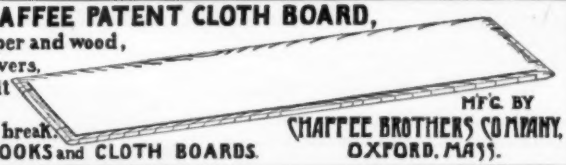

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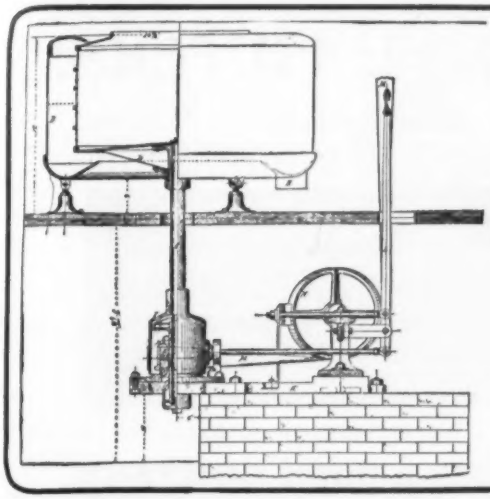

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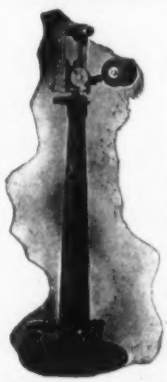

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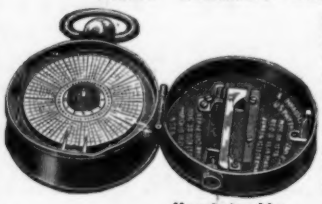
THEY CANNOT FAIL.



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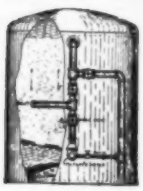

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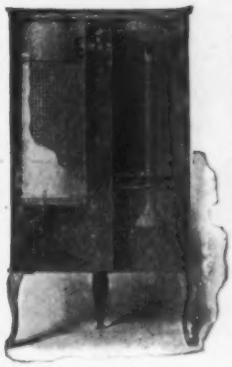

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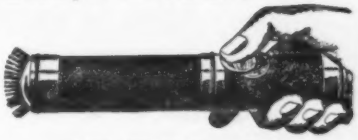

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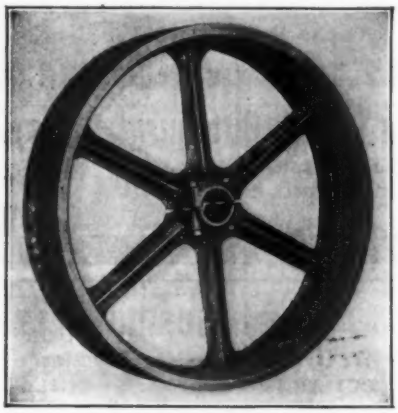

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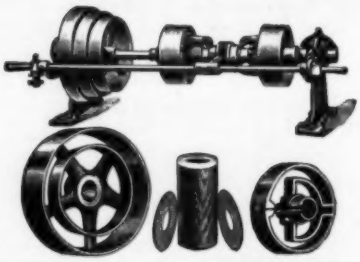

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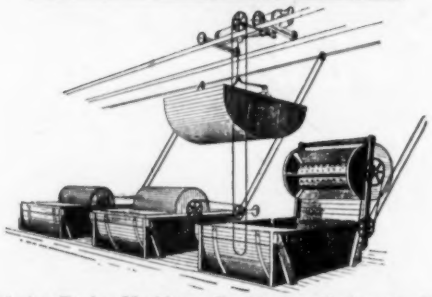

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Mills with Worsted Machinery.
Number of Spindles and Looms in the United States.
25 Textile Maps, showing location of cities and towns where there are mills.

PART II. Yarn Index.

List of Yarn Manufacturers, selling their product, arranged under proper headings.
List of Yarn Dealers and Agents.

PART III.

Classified Lists of Commission and Order Mills, Dyeing, Bleaching and Finishing Mills, Etc.

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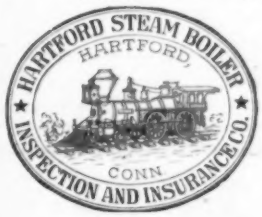

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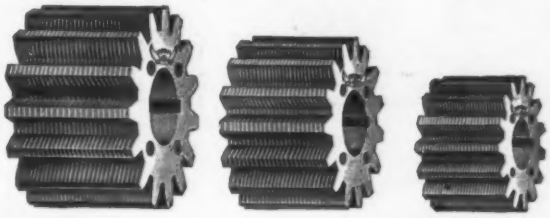

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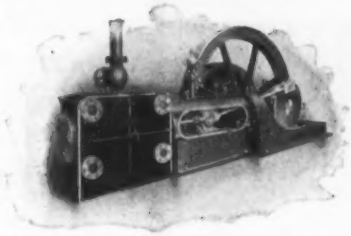

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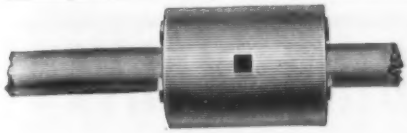

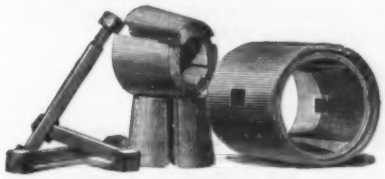

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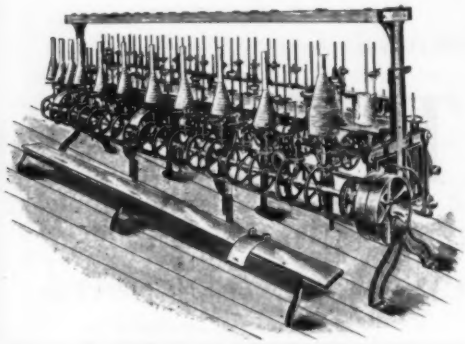

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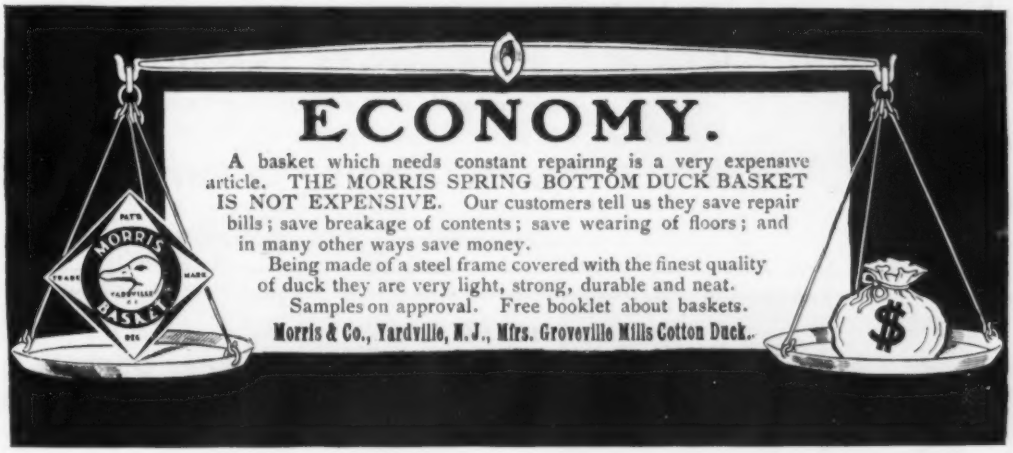

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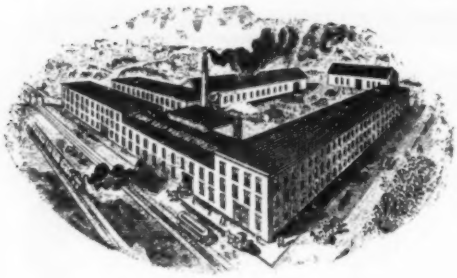

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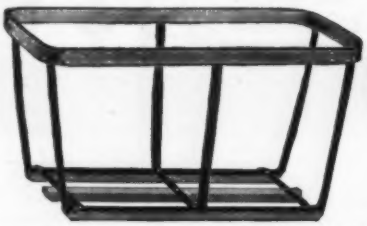

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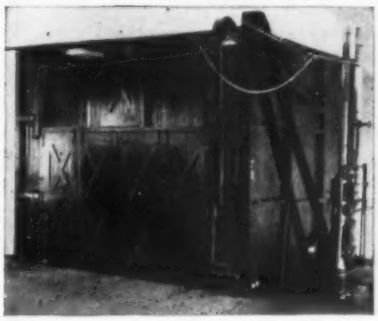

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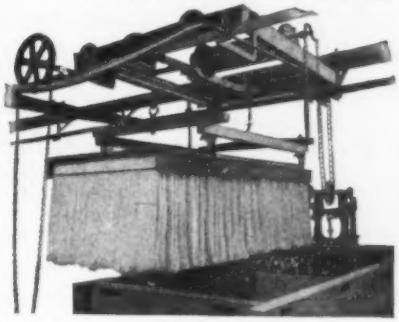

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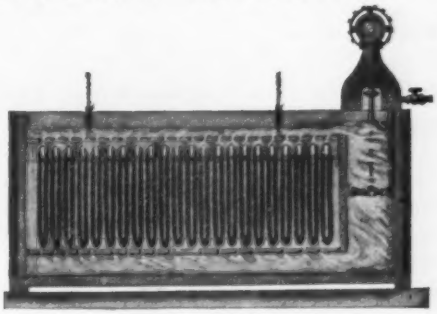

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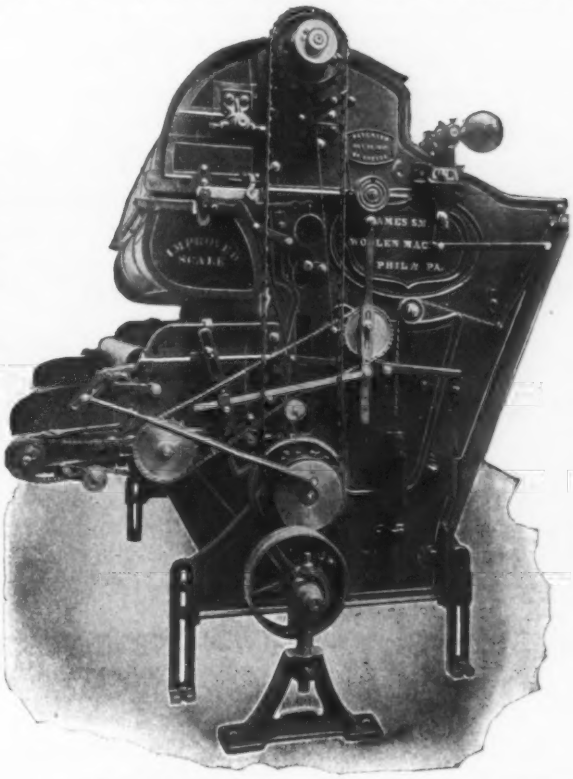

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TEXTILE WORLD RECORD.

Published Monthly by

LORD & NAGLE COMPANY,

FRANK L. NAGLE, President. HENRY G. LORD, Treasurer.

MAIN OFFICES:

95 South Street, Boston (Publication Office).

425 Walnut Street, Philadelphia.

BRANCH OFFICES:

123 Liberty St., New York. 115 Dearborn St., Chicago.

Entered at the Boston Post Office as Second-Class Mail Matter.

SAMUEL S. DALE, Editor. E. A. POSSELT, Editor Process Department.

Subscription and Directory Rates.

The **Textile World Record**, including **Annual Official Directory**, (Traveler's Edition),	$3.00 per year
The **Textile World Record**, without the **Directory**,	$2.00 per year
The **Directory** alone is $2.00 per copy for the Traveler's Edition; $2.50 for Office Edition.	
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PART III. Contains Classified List of mills doing order and commission work, also dyeing, finishing, bleaching and printing establishments, classified according to the kind of work done, and so far as possible giving width of goods handled; also shoddy, extract and flock manufacturers and wool scouring establishments.

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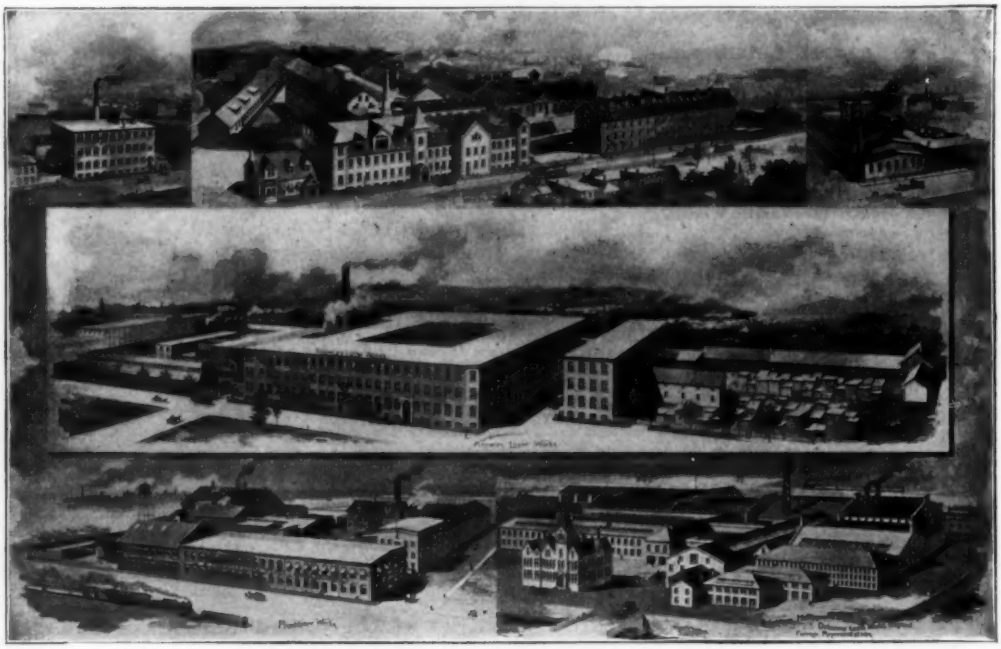

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The Textile World and Textile Record.

VOL. 25. (NEW SERIES.) AUGUST, 1903 No. 5.

Monthly Comment.

Worsted Spinning.

The first of a series of articles on the French system of worsted spinning appears in another part of this issue. It is written by a French textile engineer of long experience in the manufacture of yarn and the building of worsted machinery. The plan of the treatise involves a preliminary and general explanation of the process of French spinning, showing the points of difference between it and the Bradford or English system. This will probably occupy two issues, after which each process will be treated in detail and illustrated with numerous drawings and photographs of machines and machine parts.

At the present time there is no treatise of this kind in the English language and we are confident that it will be welcomed not only by those directly engaged in the manufacture of French worsted yarn in this country and England, but also by that large number of textile workers and students who desire to familiarize themselves with this important branch of the textile industry.

An Important Court Decision.

The "master" appointed by the New York Circuit Court of Appeals to hold a hearing in the patent case of Peter S. Kinzie against the Wright Health Underwear Company for infringement of a burr-wheel patent, has recently made a decision in favor of the plaintiff, to the effect that he could collect damages for infringement of patent and use of device invented by him. The defendants have appealed from this decision and the appeal is now pending in the courts.

About six years ago, Peter S. Kinzie, then living at Philmont, N. Y., secured a patent on a burr-wheel for the knitting of a backing thread in fleece goods. This burr-wheel, or a modification, has been adopted by a number of knitters throughout the country and manufactured by machine builders who agreed to defend any suits for infringement that might be brought against the users of the device. About three years ago the patentee brought suit against the Wright Health Underwear Company for infringement of his patent. The case was won by the plaintiff on the first trial, then carried to the Court of Appeals, which confirmed the previous decision. On request of the defendants a "master" was appointed who made the decision noted above.

The case is of far-reaching importance as the device is used by many knitters throughout the country, who, it is said, are now likely to be called upon to pay a royalty of two cents per dozen on cotton fleece goods and four

cents per dozen on woolen piece goods manufactured with this burr-wheel.

The contest is by no means settled. It is understood that the manufacturers affected have combined and propose to contest the case in the courts at every step.

Silk Goods from Japan.

In textile manufacturing the ability to compete in the world's markets depends in great measure upon the labor cost of the goods. The cost of transporting the raw material, wool, cotton, or silk, from the place of origin to distant manufacturing centres is so small that it is a relatively unimportant factor in deciding the contest for trade supremacy between manufacturing nations. The labor cost, however, varies so widely that its influence upon the trade in manufactured goods can be plainly seen.

We are familiar with the rapid development of cotton manufacturing in our Southern states, due in great measure to an abundant supply of operatives willing to work long hours for low wages. This development finds its counterpart in the silk industry of Japan where the production of silk goods has increased rapidly during recent years, with a corresponding increase in the Japanese exports of these goods. France imposes no duty on imports of manufactured silk and the influx of Japanese silk fabrics into that country has been so great, increasing from $2,200,000 in 1894 to $6,200,000 in 1900, that the French manufacturers are calling loudly for a duty on imported silks to protect them against the low priced labor of Japan. This is all the more impressive to us when we consider that the French silk operative receives less than one-half as much as the worker in American silk mills.

In a recent issue of l'Industrie Textile, Paris, are given some particulars of labor conditions in Japan which explain the seriousness of Asiatic competition to those countries that are not protected, like ourselves, by a high tariff. We quote from the French journal as follows:—

"Although raised a few months ago, the wages of the Japanese silk operatives are ridiculous from a European point of view. These operatives are mostly women and children, recruited from distant parts of Japan and brought to the silk mills under contract to work twelve or fourteen hours per day (Sundays included), the mills being operated both day and night by two sets of help with only two idle days per month. The women receive five cents per day; of this amount four cents is deducted for board, leaving about six or seven cents a week for other expenses.

"The working hours per day are not limited by law and in certain mills the operatives work from sixteen to eighteen hours out of the twenty-four. Children of seven or eight years are employed under God knows what conditions. It is easy to understand that with the wages of hand labor on a similar low level the silk fabrics of Japan can be produced at a cost that defies competition in the open market."

It is well for Americans to pause a moment and contemplate the industrial conditions that prevail in other countries. In spite of our high tariff the imports of Japanese silks into the United States increased from $3,000,000 in 1900 to $4,700,000 last year, a gain of 57 per cent. in two years, while our imports of silk goods from all sources gained less than 20 per cent. in the same time. The picture of the Japanese silk worker drawn by the French writer, the avalanche of Japanese silk goods pouring freely into France in spite of the low wages of the French operative, the increase of imports of Japanese silks into our own country in spite of our high tariff,—all should be remembered in these times of an abounding prosperity which is due to the great natural advantages of this country and maintained in great measure by a protective tariff that prevents free trade from bringing American and foreign workers to the same level.

Not up to Sample.

Court decisions affecting the relations of buyer and seller in the textile trade are of more than ordinary interest owing to the abuses that have grown up during recent years and by which manufacturers have suffered untold losses from unjust claims for imperfections, arbitrary cancellations and return of goods ordered. The New York Court of Appeals has recently decided that goods must be up to sample by which they are sold, otherwise the seller is liable in an action for damages. This has long been recognized in the trade; what manufacturers have objected to is the liberty taken by buyers to cancel, re-

turn and make claims on goods that are up to sample.

The case referred to arose during the Wilson low tariff regime. At that time immense quantities of foreign goods were imported and offered for sale in this country at prices that made competition by domestic manufacturers impossible. James Talcott, a dry goods commission agent at 108 Franklin St., New York City, ordered by sample in 1897 from A. & S. Henry of Bradford, England, fancy worsted goods to the value of $17,028.-68. When the goods reached this country and had been sold by Mr. Talcott, the customers complained of many imperfections that had not been in the samples or discovered in the goods before delivery. Mr. Talcott brought suit for the amount stated and the case has been pending in the courts for more than two years. The Supreme Court decided in favor of A. & S. Henry, and this decision was confirmed by the Apellate division, but, as already stated, on appeal to the highest court of the State the decisions of the lower courts were reversed and judgment given to Mr. Talcott. In his opinion Judge Vann, who read the decision, stated:

> Upon a sale by sample there is an express warranty that the goods are equal in quality to the sample furnished. It amounts to an understanding on the part of the seller with the purchaser that all the goods are similar both in nature and quality to those exhibited. The rule is the same whether the goods are in existence at the time of the contract of sale or are to be manufactured at some subsequent period. If the goods when delivered do not equal the sample the buyer need not return them in order to recover for the breach of warranty, but can recover the difference between the quality called for by the sample and the goods received at any time he desires to make such an application to the seller or to the courts.

The German Jute Trust.

Two years ago the jute manufacturers of Germany entered into a combination (cartel) for the purpose of restoring the vanished margin of profit by restricting production and regulating prices and selling terms. In the twenty-four months since its birth this trust has stopped by agreement 22,830 spindles and 1,148 looms. This curtailment was not sufficient to restore prosperity and several members of the cartel voluntarily stopped 4,110 spindles and 247 looms in addition, the total of idle machinery amounting to 26,940 spindles and 1,395 looms, which is 20 per cent. of all the machinery controlled by the combine. There were several independent firms operating 12,458 spindles and 348 looms, which enjoyed without expense all of the benefits resulting from the cartel. The trust found these concerns, controlling 8 1/2 per cent. of the spindles and 4 3/4 per cent. of the looms in the country, a severe menace to the success of their enterprise. When, therefore, a wealthy firm in Lansberg began the construction of an extensive jute plant to be operated independently, the members of the cartel announced the immediate dissolution of their agreement. It has been the general opinion that the combination has saved the German jute industry from bankruptcy during the past two years, and predictions of ruin are now freely made.

Business is Business.

Ever since the price of American cotton began to emerge from the poverty stricken six cent level of five years ago and particularly since it reached the truly American level of eleven and twelve cents per pound the foreign press has been vigorously promoting with printers' ink the growth of cotton outside of the United States in order to free Europe from its present total dependence on the American supply.

Cotton growing associations have been formed in England, France and Germany, to raise cotton in colonies thousands of miles distant. Resolutions without number favoring this object and denouncing American cotton speculators have been passed, generally unanimously except when calling for money to meet expenses. Governments have been petitioned to lend a helping hand. High officers of state have favored the enterprise. Government railways in Africa have offered to transport the cotton free of charge and a prominent shipping firm has promised to carry the first 1,000 tons to Liverpool for nothing.

Such a hurrah has been raised that many people have been led to believe that success was assured and that in a few seasons vast quantities of cotton would come from Africa

and force our Southern planters out of business. It takes something more than speeches, resolutions, newspaper articles and individual contributions to the treasury of cotton growing associations in countries where cotton cannot be grown to bring a cotton crop into existence. The cotton, when grown, must be suited for making yarn and cloth that will sell for more than the cost of production. The first rude contact of Cotton Growing Association theory with cotton trade practice is thus reported in the Manchester (Eng.) Guardian:

"In connection with the report that the British Cotton-Growing Association has aranged to purchase the whole of the cotton crop now being grown in Lagos, we learn that what has actually happened is this: Sir William Macgregor, the Governor of Lagos, cabled to Sir A. L. Jones, of Liverpool, the president of the Association:—'Cotton prospects are very encouraging. Too early to report extent of crop, but probably 1,000 bales. Holders appear anxious to get rid of stock.' Sir A. L. Jones replied offering (on behalf, presumably, of the Cotton Growing Association) to take all the cotton offering at 1d. per pound. This, of course, would be the price to the growers, but inasmuch as the Government railway will carry the cotton without charge, and Messrs. Elder, Dempster & Co.'s steamers will also bring the first 1,000 tons to Liverpool for nothing, the price would really be 1d. per pound at Liverpool. We have not yet heard whether the offer has been accepted, and since the cotton is described as a 'fine long-stapled variety, the growers at Lagos may conceivably think it not quite good enough. Of course, if the Association's object is to show the world (including the potential investor) how cheaply good cotton can be produced on the West Coast of Africa, the apparent niggardliness of the offer is explained away. But if, on the other hand, the object is to encourage the people of Lagos to grow cotton for the British market, is a penny per pound the price best calculated to do it?"

A member of the Cotton Growing Association then sent the following letter to the Guardian:

"I notice that the writer . . . alludes to the 'niggardliness' of the British Cotton-Growing Association in only offering the natives of West Africa 1d. a pound for their cotton. He is probably unaware that this offer is not for 'lint cotton,' but for 'seed cotton.' As it requires from three to four pounds of the latter to reproduce one pound of lint cotton, 1d. a pound really means 3d. to 4d. a pound, to which has to be added at least 1d. a pound to cover cost of ginning, packing, and all other charges. Practically the British Cotton-Growing Association is offering 4d. to 5d. a pound for all cotton which West Africa can send, a not unfair price when one considers that most of what is being offered at present has been grown by the most primitive methods and with practically no cultivation at all. It might possibly be advantageous to offer a fictitious price, say 1 1/2d. to 2d. a pound, so as to encourage this new industry in the earlier stages; but if this is to be done on a large scale the funds at the present disposal of the Association are altogether inadequate. However, if Lancashire wishes the British Cotton-Growing Association to 'subsidize' our Colonial cotton growers let her say so, and at the same time provide the Association with the necessary funds to carry out her wishes."

Upon this the comment of the Guardian was as follows:

"The explanation that the Lagos cotton for which 1d. a pound has been offered is seed cotton undoubtedly puts a different complexion upon the offer. Our own impression, however, is that the average proportion of seed to lint in seed cotton is only about two to one, and that the cost of picking and ginning is half met by the value of the cotton seed recovered. It is well to have these points cleared up."

A letter was also read from Mr. J. R. Prince, cotton growing expert at Onitsha, Southern Nigeria. It is dated Onitsha, 11th June, 1903, and is as follows: "Since writing you last mail I have received instructions from the High Commissioner authorizing me to only pay 1 1/2d. for cotton. I would suggest that I be allowed to pay more for all cotton brought me by natives. The natives are very much discouraged that they could only get 1d. last year for their cotton. Everything possible ought to be done to encourage the native to take up the cotton industry, and if I were allowed to pay say 2d. per lb. for their cotton it would, I think, encourage them to grow it. Some of the natives have to bring the cotton several days' march by land before they get to a waterway."

One Result of a Textile Combine.

Some years age the dyers and finishers of Roubaix, France, formed a combine to regulate prices and terms at which their work should be carried on. The result, from a pecuniary point of view has been very satisfactory. The ruinous competition which prevailed when each concern was acting independently of the others, has disappeared. Prices have been higher and more uniform. Profits, although not large, could be counted on with a fair degree of certainty and the trade had settled down to the conviction that the arrangement was of great benefit to all.

Recently, however, there have appeared contrary signs. The business of the Roubaix dyers and finishers has been declining. The spinners and weavers have been sending increasing quantities of goods to be dyed and finished outside of Roubaix. This movement

has forced large numbers of Roubaix workmen into idleness. The cause assigned is the poorer quality of the work now done by Roubaix finishers. It is stated that the facilities of that place for finishing are equal if not superior to those of Elboeuf and Louviers, where the work lost by Roubaix is now being done. The water is as good, the workmen as skillful, the price as low and the appliances equal, still the goods are sent away to be finished. The one point of difference is the quality of the work. The spinners and weavers claim that better colors and a better finish is obtained outside of Roubaix, whereas formerly the reverse was true. The deterioration of the work is laid to the lack of competition which formerly stimulated each Roubaix finisher to keep abreast of the leader in his line of work. The combine which raised prices made the many individuals into practically one firm, and, while putting an end to price cutting likewise put an end to that ambition to excel which made the high reputation of the Roubaix colors and finish. The experience of this French city discloses a defect in trusts and combines, which already is well recognized in this country. How to preserve the benefits of competition while destroying its evils is the problem that faces the managers of our trusts. The combination stops price cutting, reduces fixed charges of manufacturing and dispenses with the middleman, but these advantages are offset by that serious loss of that intense personal interest of the mill manager in the success of the mill, which ownership only can inspire.

Idle Cotton Mills in England.

Owing to the high price of cotton, the inability to get the right kind of cotton and the continuance of low prices for cotton goods, the cotton spinners of England have quite generally joined in the agreement to close their mills for two days per week. It is estimated that 75 per cent. of the English cotton mills are now running but four days per week.

This will have its effect in increasing or rather preventing a further decrease of the stock of raw material, and it will also decrease or prevent an increase in the present stock of yarns and fabrics, thus serving to equalize the levels of prices and stocks without adding an ounce to the world's supply of cotton.

The Opening Prices of Light Weight Woolens.

The cost of manufacturing woolen and worsted goods depends in great measure upon keeping the machinery fully employed. A large part of this cost for labor and supplies may be classed among fixed charges, which in the aggregate remain practically stationary whether the mill is running full or turning out but a part of its possible production. For this reason the cost per yard rises rapidly when the production decreases. A recognition of this fact is of vital importance to success in manufacturing. That it is recognized by the largest textile manufacturing corporation in this country is shown by the opening prices for light weights made last month. The various lines of the American Woolen Co. were opened at about 2 1/2 cents per yard below the prices of the leading competing lines. That the connection between a large production and a low cost per yard is recognized by others was proved by the quick reduction of the Gilbert goods to a level of 2 1/2 cents below the American lines. These reductions have undoubtedly proved a depressing factor in the men's wear trade, but there is no question but that they have been dictated by a sound business policy. The managers of these companies are, probably, as anxious as any business man to get as high a price as possible for their goods. They are equally anxious to make the goods at the lowest possible cost, hence the measures taken to secure orders that will keep their machinery busy. A reduction of 2 1/2 cents in the price per yard may in this way easily prevent an increase of 5 cents per yard in interest charges, 2 1/2 cents per yard in the cost of fuel, 2 1/2 cents per yard in the cost of many single departments of the mill, and possibly 20 cents per yard in the total cost of manufacturing. When the business of selling goods is added to that of making them, the fixed charges of an expensive selling organ-

ization makes a full production a still greater necessity. Whatever may be said of the opening prices as indicating general business conditions, it must be admitted that the reductions in prices already referred to are unquestionably wise from the standpoint of the balance-sheet of the vast industrial organizations which have come into existence in recent years.

Bull-Bear Business in Cotton.

The recent rise in cotton and consequent increase of speculation in this commodity has called public attention to the evil of gambling in cotton futures, and cornering the available supply. These operations are to a large extent gambling and nothing else. They seriously disturb the calculations of manufacturers and merchants, introducing an element of uncertainty into business which under legitimate conditions is subject to great vicissitudes.

The cause of the evils is found in the natural propensity of mankind to gamble. That this is as widespread as humanity itself is indicated by accounts received from India as to the increase of speculation in cotton throughout that country. The Indian Textile Journal referring to this subject, in a recent issue says:

Ever since the telegraphic communications between India and Europe and America have been established, immense speculation in cotton has gone on, especially in Western India. It is not confined to Bombay city only. The contagion has spread all over the principal marts whence cotton is exported; it is rife in Surat, in Ahmedabad, in Gogo, in Bhavnagar, in Dhollera, in Barsi, in Julgaum, in Khandwa, in Nagpur and in other places. There go on continually gambling transactions or wagering contracts which are euphemiously known as teji mundi, that is bull-bear business. Hundreds with small fortunes have been ruined; while there have been some lucky folk who from nothing have been able to amass fortunes. But the entire affair is discreditable and demoralizing.

Of late, owing to the inordinate speculation in what are known as "futures" in New York and Boston, there has been correspondingly inordinate gambling in cotton in Bombay. Every year, commencing with 25th December, Vaidas, or time bargains in cotton, are adjusted. First comes Bengal, then Broach, then Bhavnagar, and so on. Speculation goes on a colossal scale for the purchase and sale of so many bales above and beyond the actual average annual crop of each description. For instance, a transaction of a thousand bales would pass through at least a dozen hands. A single "teji mundi" business will be recorded as having been for 12,000 bales!

Enormous bargains of this character are daily entered into at almost all the speculative bourses of the world. Every one of these is a purely nominal transaction in buying and selling a particular commodity. Two persons meet, one of whom believes in a rise, and the other in a fall. The transaction is concluded, and according as there is a rise or fall the difference is adjusted and paid for by the one party or the other. One time the "bull" gains; another time the "bear" gains, or vice versa. But no actual merchandise passes from hand to hand. Speculators of this class are a guild by themselves. And as there are bookmakers at a horse race so there are bookmakers here. They let large exchange rooms where they may attract all idlers with sufficient margin to put their stakes through. Thousands are tempted, by the bait offered, to these rooms or halls, which are their daily trysting places. In fact, they organize themselves to the very pitch of refinement, and ply their speculative transactions as if they were so many bona fide traders dealing with actual commodities valued at millions!

Cotton Raising in Asiatic Russia.

For the past ten years the Russian Government has endeavored by every possible means to stimulate the production of cotton in Central Asia, and thus make the domestic cotton industry independent of the supply of raw material from America. The efforts in this direction, according to the Lodzer Zeitung, have included extensive schemes for irrigation, experiment stations, new railway lines and a high protective tariff on imports of foreign cotton. These measures have resulted in a considerable increase in the crop, but at the present time the industry is at a standstill. The crop for 1902 is 13 per cent. less than in 1901. The decrease is due in great measure to the unsatisfactory results obtained from plants raised from American seed. The decrease here amounts to 32 1/2 per cent., while that portion of the crop from domestic seed shows an increase of 32 per cent. The area planted this season is 19 per cent. less than last year. In some districts the plants were seriously injured by a blight which cut the crop down to one-third of the previous year's production per acre.

The entire crop for 1902 amounted to about 276,000,000 pounds, or 550,000 bales of 500 pounds each. One cause that greatly restricts the growth of cotton in Central Asia is the practice of selling the growing crops be-

fore the cotton is picked. It seems that such sales are made by the area planted and not by the pound. The planter after selling becomes careless both as to quantity and quality and takes very little interest in his work.

The Russian minister of finance is endeavoring to remedy this evil and bring about a condition where the growers' return will be in proportion to the size and quality of the crop. New irrigation plants are projected and measures are being taken to improve the transportation facilities and experiment stations and to secure a supply of good seed. The greatest interest is being taken by the Russian government in this work in order to make the domestic cotton industry independent of North America.

A Silk Cocoon Trust.

A movement has started among the silk spinners of Avignon, France, to organize for the professed purpose of restricting certain abuses that exist in the purchase and marketing of cocoons. At present brokers or their agents visit the breeders throughout the country and make contracts in advance to take the cocoons at the highest market price. This to a considerable extent takes from the breeder the incentive to improve the quality of his cocoons. Assured of a market at a fixed price his sole object is to turn out a large quantity, and, as a consequence of this state of things, the spinners find the silk inferior in quality and difficult to handle. The evils of the present methods have forced the spinners to organize for their protection. A committee has been appointed to form a plan of operations. The whole trouble arises from future contracts for cocoons. If these can be abolished and the bargains made and prices fixed when the cocoons are ready for delivery, the breeders' compensation will depend not only on quantity, but also on the quality of the silk. This will stimulate him to produce a better product, a result that will be of great advantage to the whole silk trade.

Empress cloth received its name from the Empress Eugenie, for whom the fabric was originally designed.

The Decline of the Natural Indigo Industry.

Official statistics of the 1902 indigo crop in India show a decrease of over 50 per cent. as compared with the previous year. Such a rapid shrinkage in one year indicates that the vanishing point is not far distant. The production in 1902 amounted to but 43,120 maunds. The first receipts from Calcutta were in November and the first auctions were not held until the fifteenth of December and then only for small quantities. The sales continued small up to the end of January and the inquiries were only for the most desirable qualities. In October the crop was estimated at 45,000 maunds, but it became evident by February that this estimate was too large, consequently the market strengthened somewhat, inquiries coming particularly from the United States. Fine qualities of last season's growth were very scarce while the superfine grades were not produced at all. The production in lower Bengal and Bebar was extremely poor. Benares and Oudh made a somewhat better showing. An important part of the crop was reserved for domestic use and a large part of the remainder was held by the producers. The following list shows the size of the indigo crop for the last ten years:

1893, 116,329 maunds	1898, 124,580 maunds
1894, 166,400 maunds	1899, 86,800 maunds
1895, 162,200 maunds	1900, 112,000 maunds
1896, 158,800 maunds	1901, 94,000 maunds
1897, 110,212 maunds	1902, 43,120 maunds

Cotton in Porto Rico.

The people in Porto Rico are taking much interest in cotton raising, doubtless on account of the high price of cotton and the low price of tobacco. They are giving their attention particularly to the Sea Island cotton, for which the climate and soil of Porto Rico are said to be peculiarly adapted. In many districts planters are abandoning tobacco and planting cotton. This is especially true in Cayey and Cazuas. So far the results have been very promising. At one time large quantities of cotton were raised in Porto Rico, but in recent years the industry has almost entirely disappeared.

Seasonable Fabrics.

MEN'S WEAR WOOLENS.

After several months of dullness, inactivity and waiting the mill agents are now beginning to wake up to the fact that they are in business to secure orders and keep their mills going. Their new lines for 1904 are gradually being opened up and they state that satisfactory purchases have been made, although the bulk has been for the home market and for the lower grade of goods, both in fancy worsteds, clays and serges; quotations are from 2 1/2 per cent. to 5 per cent. above those of last year.

The higher class of fancy worsteds have not yet been shown at this writing, but the American Woolen Mills have now taken the lead and are opening up new lines daily. Prices of piece dyes show a decline of 2 1/2 to 7 1/2 per cent., and the contest between the American and Gilbert lines has caused a feeling of uncertainty in the trade. Clays are heavy and not very much in demand, although low grades suitable for the southern trade are used by cutters up to a limited extent. The quotations for thibets rule about the same as last year; generally speaking, orders have been very conservative, manufacturing clothiers taking sample pieces only to be made up for road men and to feel the pulse of the trade. The most prominent feature of men's wear last season was the demand for the homespuns and present indications are that these will be more popular if anything next summer. Both black and navy serges are now almost as staple as brown cotton and in request all the year round. Fancy worsteds are said to be increasing in favor. Duplicate orders for the heavier goods such as kerseys and other class of overcoatings are coming in quite freely.

DRESS GOODS.

The outlook is most encouraging. The manufacturers state that business in this branch of the trade is very satisfactory. Initial orders in some instances have been taken liberal enough to cover the entire season's production. The cutter up has been the largest purchaser. Owing to the strikes that have taken place deliveries are in many cases very much behind hand, and will be a source of annoyance to manufacturer, jobber and retailer alike. Zibeline is today the most prominent fabric, but indications seem to point that reorders for this cloth will not be up to expectations; it has held first place for several months, many of the designs in this fabric are too pronounced for the general

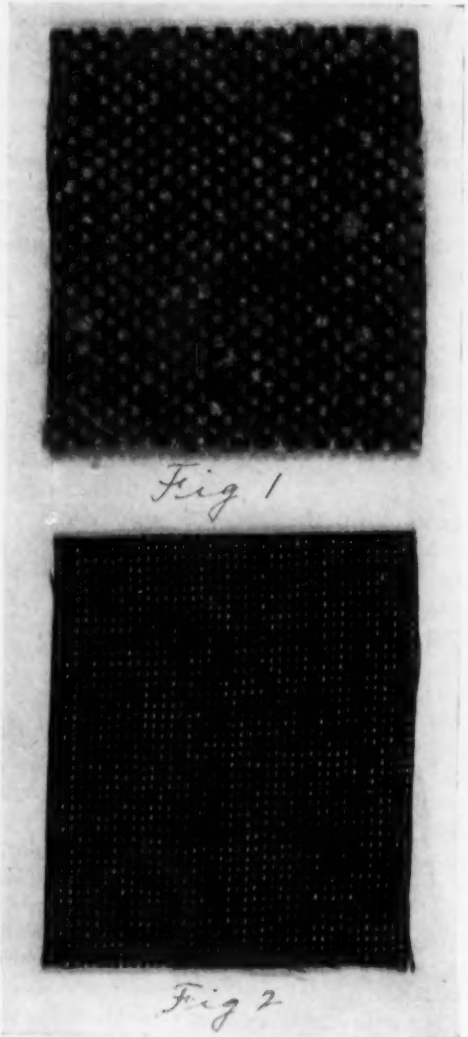

Fig 1

Fig 2

trade, and few buyers are inclined to invest freely in fancies or designs that of necessity must be somewhat restricted. The fact that mannish effects have taken so well has prompted the manufacturers to prepare for a good demand for this class of fabrics for spring, and some very attractive lines of cheviots, crashes, tweeds and similar goods have been placed upon the market.

Broadcloths and Venetians are in moderate demand. Fig. 1 illustrates a Scotch novelty suiting 54 inches wide and allows the jobber a good margin at 85c. This is sold by F. W. Corse & Co. through Shefer, Schramm & Vogel. It comes in a large variety of combinations such as navy, moss-green, olive, tobacco brown, and black ground with white warp and red and emerald raised dots.

Fig. 2 is a 60-inch shower proof cloth named the "Dorkensford," and is adapted for capes and suits for serviceable wear. This fabric is sold by the same firm.

The demand for mohairs is not quite so active as it was a month or six weeks ago, but the importers state that they have no reason to complain or feel any degree of uneasiness. They still have orders on hand for white and cream, and pastel shades suitable for evening wear are in limited request. Mohair goods are also freely bought by cutters up for waists. Voiles and Etamines maintain their popularity and satisfactory business for fall delivery is reported on these lines.

SILKS.

The principal feature of the silk market has been the demand for black taffetas, peau de cygne and peau de soies, with Louisines good seconds. Taking into consideration the shortage in the volume of the Italian raw silk crop, it is surprising that greater advances have not taken place. It is fortunate, however, that the Japanese raw crop is above the average, otherwise the price would undoubtedly be materially enhanced.

Pongee and Shantung have held high place in favor since the beginning of the season. Some of the best numbers are exceedingly scarce and the supply has by no means kept up with the demand, more especially in white and natural.

Some talk is being indulged in by those buyers who have recently returned from Europe to the effect that fancies will soon be in favor again, but the demand this season has not yet developed any degree of confidence in fancies, with the exception of small neat jacquard effects, and hair lined stripes and few broches in white ground with black floral and

geometrical figures. Fig. 3 illustrates this brocade in white warp with black filling. These also come in all gray effects and are the production of the Paterson Mill, represented by Valentine & Bentley. Fig. 4 shows a broche poplin 21 inches wide; these come in a full line of colors such as brown, moss green, navy, garnet, black with raised white jacquard figure and are sold by the jobbers at 70c. Helios and the various shades of purple will be prominent during the coming season. The only novelty in the market is a fine crepe with hand painted broche, the production of a

Lyons loom. Crepe de chene makes up so beautifully that it is expected to be in better demand than ever during the coming winter. Plaids for the time being are entirely out of the market.

VELVETS.

The trade in velvets and velveteens is in a very healthy condition. Both manufacturers and importers state that the orders which have been taken for fall are most satisfactory. During a conversation with Mr. Van der Bucle of the firm of A. Wimpfheimer & Bro., he stated that the use of pile goods for wraps and dresses is a feature likely to be important just as soon as the retail season opens. In the employment of velvets for outside garments, blacks are by far the most important to consider, and a feature for this fall which has come to the front in this country is fast black velveteen. Heretofore there has been a so-called fast black velveteen in the market and while they were fast black in name, the color was very objectionable. Today they have reached a state of perfection that we can show fast black velveteens that are guaranteed free from smutting and still has its beautiful rich black lustre. This article will be very much in vogue this fall in this country, as it has reached a point now that a lady in order to be well dressed will add one velvet costume to her wardrobe.

Figs. 5 and 6 illustrate extracted velveteens imported by the same house, and come in very beautiful designs for this season's wear and are very much in favor. They are made up into costumes and shirt waist suits. Extracted velveteens are made up by a secret process in Manchester, England, and they are prominent and fast and certainly are very desirable as well as fashionable. A new idea in velvet waistings has been developed. It is white velvet with neat designs in vesting effects. It is washable and therefore practical as well as beautiful.

COTTONS.

The raw material has been sold this week at 13 1/2c., the highest figure since 1872, with the result that famine prices are talked of. With mills shutting down in every direction and others only employing their looms half time the outlook is gloomy and depressing; yet if the next two months can be successfully weathered until the new crop will be marketed, a reaction and a decline must necessarily follow. Domestics and low grade manufactured goods are sold today on a basis of 9 1/2c. raw material. The prices of 9 oz. denims and wide sheetings have advanced about 50 per cent. within five years. In 1898, 9 oz. denims were sold at 9 1/2c.; today the price is 13 1/2 and 14c. and difficult to obtain at those prices. Hickory stripes and other checks are practically out of the market. The same may be said of Pequot sheetings. Buyers in all parts of the country have been buying in a most conservative manner, hoping that by the time they were coming to the market quotations would be lower. They now realize that this was a mistaken policy. First hands maintain an independent attitude, and better prices can in almost every instance be obtained from the jobbers, that is if they have the goods on hand.

It is probable that prices will rule high even when the new crop is put on the market and that a higher level has been reached, taking for granted that the new crop is as large as that of last year, owing to an increased demand and the inferior quality of the present crop. This is the consensus of opinion among the mill agents generally. For the next two months an advance over present price can be confidently looked forward to, as an influx of buyers into the market will create a demand, and however conservatively they may buy, the aggregate will be of considerable volume.

Canton flannels for spot deliveries is another commodity practically out of the market. Bleached cottons of the 64 by 64 variety continue to be held at 5 1/4c. and this price is paid without protest. Ducks are moving slowly, and some numbers cannot be secured within 60 days.

The cotton blanket business is in a precarious condition. These goods cannot be obtained from first hands and the jobbers' stocks are limited. Heads of departments will only sell such goods to their regular trade and this is done more as a favor than a matter of business. There has been no material

advance in prints and staple checked ginghams, but mill agents state that their mills have more orders on hand than they can turn out for months to come. Orders for indigo blues and turkey reds cannot be filled without months of waiting. Three yard sheetings are

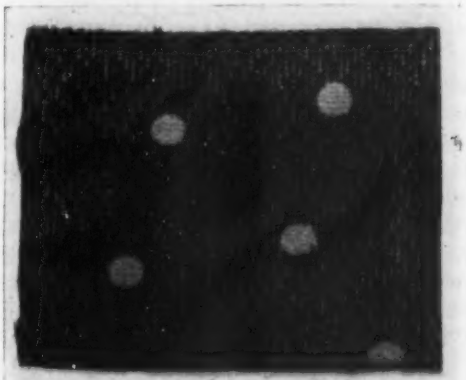

Fig 5

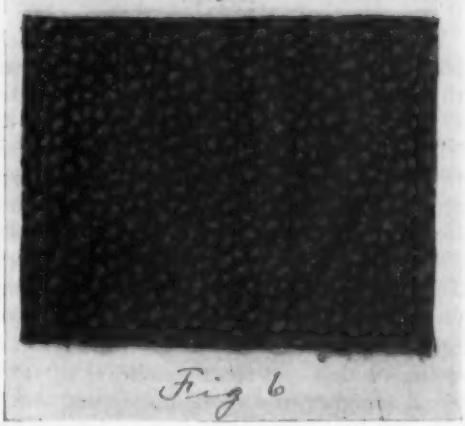

Fig 6

still held at 6c., with standards at 6 1/2c., while 4 yards 56 by 60 are quoted at 5 1/2 to 6c.

WASH GOODS.

While white mercerized jacquards will hold their own, 1904 will see a great many colored checks, stripes and figures. Gauze grenadines in striped and plaid effects in all delicate colors, and also in black will be in favor and many beautiful designs are shown.

Fine Swisses, etamines and chiffonettes showing a combination of white and ecru are particularly attractive. These come in all over patterns, revere stripes plain or enhanced with embroidery. A sheer ecru cloth showing white embroidery produces a very effective combination and is suitable for any dressy purpose.

LININGS.

Trade has for several months been at a low ebb with converters, although a normal mid-season business has been accomplished. All grades of percalines and silesias have been quiet. Mercerized fabrics and other lines of high finished goods have been quiet and unchanged as to price. Cotton warp Italian alpacas and mohair serges have been in little request. The same could be said of canvasses and paddings. Kid finished cambrics 64's are in fairly good demand at 3 3/4c. No material advance has taken place on silk and silk warp linings and the demand for goods of the character has been limited. Good business is, however, looked forward to during the present month, and there is no doubt but that this branch will share in the renewed activity which will characterize the market in the near future.

The Cotton Industry in India.

According to a statement recently issued by the Bombay Millowners' Association, there are in India at the present time 5,006,965 cotton spindles and 42,584 cotton looms. These figures show no material increase in spindles over last year, but a remarkable increase has taken place in the quantity of cotton consumed, rising 30 per cent. from 529,882,000 lbs. in the previous year to 691,894,896 lbs. in the year just closed. This is equivalent to a consumption of 138 lbs. of cotton per spindle for the past year as compared with 106 lbs. per spindle for the preceding twelve months. This increase is due to the increasing size of the yarn spun and is explained by the increased cost of Egyptian cotton.

The number of looms increased slightly from 41,180 to 42,584. The employees increased in number from 172,883 to 181,031, owing to the greater amount of labor in handling the larger production. In 1893 there were 3,571,917 cotton spindles in India as compared with 5,006,965 in 1903, showing an increase of 40 per cent. for the ten years.

French Worsted Spinning.

BY A FRENCH TEXTILE ENGINEER.

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At present there is no exhaustive work in any language treating of spinning worsted yarn by the French system. McLaren's "Spinning Woolen and Worsted" is an excellent treatise, but it refers almost entirely to the Bradford system of spinning. Now the Bradford is very different from the French system. The first is employed almost exclusively for working long, medium and coarse wool, while the French system is used for working both fine and coarse, long as well as short wools. At present all grades of wool, including the longest as well as the shortest staple are manufactured into worsted yarn in Germany and France by the French system. The best part of the wool is utilized and the percentage of noils is smallest, consequently the yield from the raw material is the highest obtained with any system of spinning.

It should not be assumed from the name of the system that it is used only in France. It has been generally adopted throughout Germany, a country distinguished for its careful and thorough methods of manufacture. In speaking of the French system we therefore mean that method of manufacturing worsted employed not only in France, but in Germany, Spain, Italy, etc., that is to say, in the whole of Central Europe.

We shall not, as is too often done in works of this kind, devote too much space to the generalities of the subject, such as the nature of the wool, the countries of production, etc. Such information may well be omitted here where we purpose to study thoroughly the machinery and processes of manufacture.

1.—WOOL GROWING.

We will merely say here in a few words that the wool growing countries are: First, Australia, which produces about 220,000,000 pounds of wool per year; second, Cape Colony, with a production of 44,000,000 pounds per year; third, South America, with an annual clip of 110,000,000 pounds of grease wool. Other wool producing countries are of minor importance.

2.—STRUCTURE OF THE WOOL FIBRE.

The wool fibre appears under the microscope to be composed of a series of small cones or cornets, placed in succession one inside the other. If a number of paper tubes such as are used in mule spinning are placed inside of each other they will exhibit a very marked resemblance to the wool fibre as seen under the microscope. Wool fibres are, therefore, rougher in one direction than in the other. An experienced person, by stroking a wool fibre between his fingers, can distinguish this peculiarity of structure which places a certain roll in the processes of manufacture, particularly in drawing.

3.—DIFFERENCES IN WOOL FROM THE SAME FLEECE.

There are a large number of different qualities obtained from the same sheep; they vary with the part of the body from which the wool is clipped. For example, the wool from the belly is short and devoid of elasticity, while the best qualities and the longest, strongest, most elastic fibres come from the sides and neck. It does not answer, therefore, to shear the sheep promiscuously and then mix the fleeces from the same race together in one pile, and put the mixtures thus employed through the machines. That would result in having widely different qualities of wool mixed together, the short, coarse and tender with the long, fine and elastic, depreciating the value of the last named and preventing the yarn from becoming uniform and free from bunches. The working of long wool requires a different adjustment of the rollers and a different setting of the needles from those required for short wools. It is therefore necessary to shear the fleece in one piece so that the various parts may be readily recognized and the work of separating inferior from better qualities facilitated.

4.—QUALITY AND STRENGTH OF WOOL.

The inferior fibres are recognized not only by their shortness, but also by their lack of

elasticity, pliability and strength. To test the strength of the fibres a small lock is taken between the fingers and an effort made to break it. Experience enables a person to distinguish immediately the strong from the tender

FIG. 1.

wool. The fineness is judged by the number of undulations in the fibres. For example, the fibre shown at a, Fig. 2, is much coarser and less elastic than that at b, because the former has less curves or undulations than the latter. Generally speaking the more sinuous and curly the wool, the finer is the quality. To illustrate: The undulations in the finest

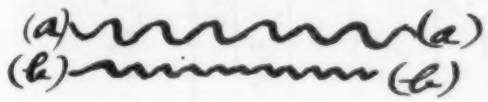


FIG. 2.

Merino will reach as high as 30 per inch, while in the coarsest wool they do not exceed 10 per inch. This quality is the most highly esteemed of any, as it is indispensable for the production of fine, uniform yarn. There are instruments of precision used in the trade for determining the fineness of wool. Such apparatus are very complicated, expensive, and but little used owing to the time required for reaching results. They are used but very little in Europe and practical men content themselves with judging the wool by sight. That is to say, the wool is taken in the hands and examined while being drawn out and finally broken, to determine the fineness, pliability, strength and length in one rapid operation.

5.—NECESSITY FOR SORTING WOOL.

From what has been said it is evident that the first operation to which the wool must be subjected on arriving at the mill is that of careful sorting. It is also evident that this operation can not be done mechanically, as it requires judgment, attention and experience on the part of the workman in order to properly separate the medium and low qualities from the better portions of the fleece, and when thus separated to classify them according to their diverse qualities so that each may be worked separately on suitable machinery.

After sorting, the wool is scoured and rinsed to rid it of all impurities such as dirt, suint and grease, which form the greater portion of the weight of raw wool. It is true that before shearing the sheep they are often washed in the river to remove the heavier impurities and suint, but that does not dispense with the necessity of scouring the wool after sorting. Most wool after sorting and before scouring is run through a duster or opener in order to remove the loose dirt and foreign material such as sand, pieces of sticks, stones, etc.

6.—LENGTH OF WOOL FIBRE.

Wool does not consist of fibres of the same length. On the contrary it is a mixture of all possible lengths varying from the longest of the long staple grades to the shortest of the short qualities. Some of the fibres are so short as to resemble dust.

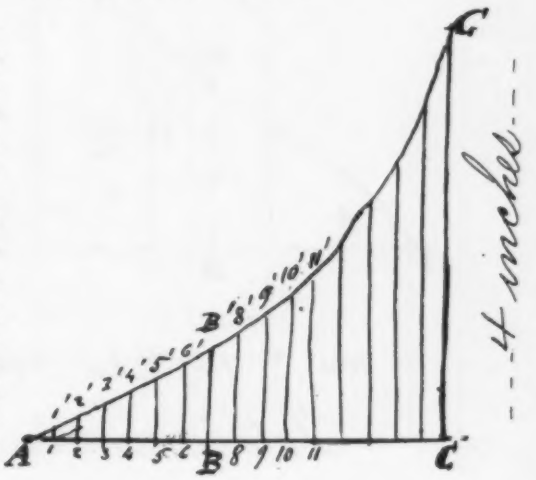


FIG. 3.

If a bunch of wool is taken at hazard from the sliver as it comes from the card and carefully examined, it will be found to contain fibres varying in length from the shortest to the longest. It will also be found that the shorter fibres are much more numerous than the long ones, and if the observer has the patience to measure and count them it will be found that the number will increase as the

length decreases. Take, for example, a medium wool with a fibre 4 inches in length. That designation means that if a tuft of the material is taken as it comes from the card the longest fibres will measure 4 inches. If those at 2, 2′; there will be less of the fibres at 3, 3′ than at 2, 2′, and a less number at 4, 4′ than at 3, 3′, and thus the number will decrease successively till we reach the longest, C, C which will be the least in number. If,

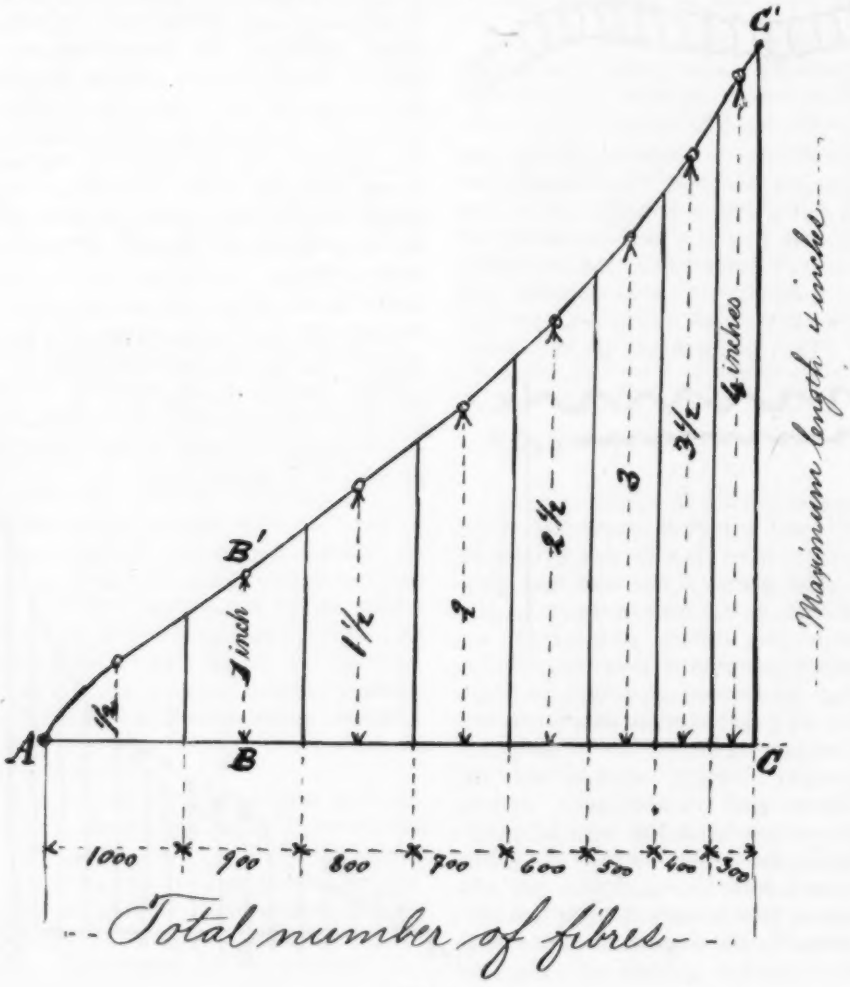


FIG. 4.

now we count the fibres in such a tuft and classify them according to length, placing the longest at one side as shown in Fig. 2, and following with the next longest, being careful to keep the adjacent fibres at the same distance from each other, we will find that the fibres in the tuft will form a triangle, Fig. 3. The longest fibres are placed at C, C′; the shortest (with the length of zero) at A. The fibres at 1, 1′ will be found to be more numerous than

for example, we should count and measure 5,200 fibres taken as the stock comes from the card the classification might be found as follows:

Length.	Number.
½ in.	1000 fibres.
1 in.	900 fibres.
1½ in.	800 fibres.
2 in.	700 fibres.
2½ in.	600 fibres.

3 in.	500 fibres.
3½ in.	400 fibres.
4 in.	300 fibres.

Fig. 4 represents these fibres arranged at equal distances from each other in the order of their length and is drawn to the exact size. A glance at Fig. 4 will convey to the experienced man a better idea of the structure of wool, than can be obtained by any amount of description and explanation. If, for example, he wishes to know the weight of the fibres one inch or less in weight in 100 pounds of wool, he need only determine what proportion of the whole surface, A, C, C′, is included in the space A, B, B′, Fig. 4, if, (A, B, B′)÷A, C, C′=(9÷100), then 9 pounds of each 100 pounds of wool consists of fibres one inch or less in length.

The curve of the diagram, Fig. 4, gives the exact idea of the staple or length of the wool, and answers perfectly for distinguishing from each other different grades of wool having the some maximum length or which may vary in the proportions of shorter fibres. For example, Fig. 5 represents another grade of wool having the same maximum length, 4 inches, but containing a much larger proportion of long fibres than that at Fig. 4. At Fig. 5 the inclined line, A, B′, C′, is nearly straight, while at Fig. 4 it is of a pronounced concave form. This indicates plainly that in the wool shown at Fig. 5 there is about the same number of fibres of each length from 0 to 4 inches, while in Fig. 4 the short fibres are much more numerous than the longer ones.

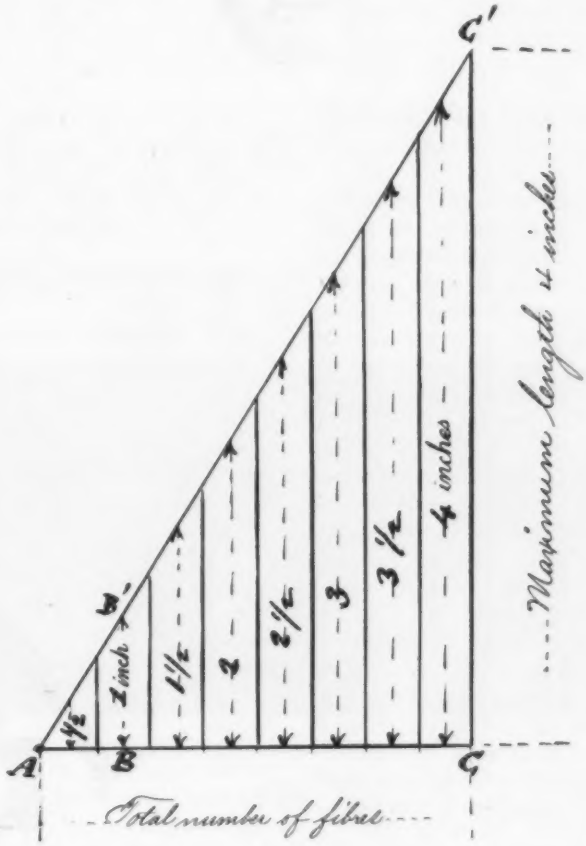


FIG. 5.

If we want to know the proportionate

weight of the fibres measuring one inch and less in length we determine the relation between the total area, A, C, C′, and the area, A, B, B′, thus, (A, B, B′)÷A, C, C′=(6÷100). In other words, there are 6 pounds of fibres measuring one inch in length in each 100 pounds.

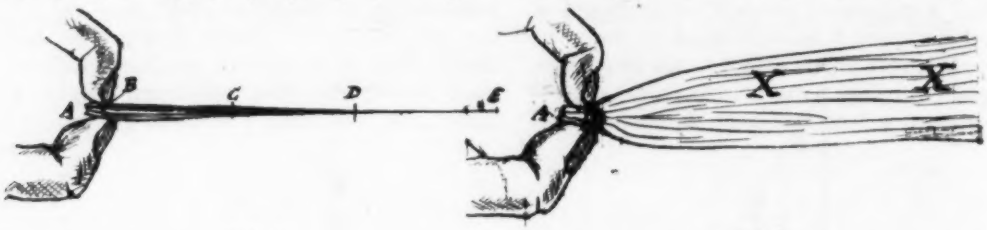


FIG. 7. FIG. 6.

It will be seen from these two examples that if the comb is set to remove all fibres measuring one inch or less in length, the wool shown at Fig. 4 will give 9 per cent. of noil, while that at Fig. 5 will yield but 6 per cent. Moreover the yarn from the sample Fig. 4 will be inferior, fuzzier, and more irregular than that spun from the stock at Fig. 5 because the former contains more short fibres than the latter. The short fibres in Fig. 4 will project from the thread making it irregular and tender. This shows that it will not do to judge wool by its maximum length. To determine the maximum length it is especially necessary to know the proportions of medium, short and very short fibres. This indicates the relative values of the different qualities of wool having the same maximum length. There are various instruments for measuring and indicating quickly the relative length of fibres in a lot of wool, and consequently its value. We will refer to them later on and explain their operation and practical value.

Suppose we have a sample of carded wool in the form of a sliver X X, Fig. 6. It is necessary to have the wool carded because before carding it is in the form of loose tufts, separate and distinct, each differing from the other in its composition and in the proportion of short fibres. In order to determine the average it is necessary to have the wool mixed thoroughly as is done on the card. A small tuft of the carded wool is held between the thumb and finger about one-half inch, A B, at the end being so held. These fibres are drawn gently from the sample in order to separate them by one movement while the other end of the sliver, X X, is held by the other hand to prevent the fibres not clasped by the thumb and finger from being withdrawn. Fig. 7 shows the part withdrawn, A, B, C, D, E. B, E, is the maximum length of the wool and can be readily measured.

(To be continued.)

THE SHIRREFF SHUTTLE CHECK.

H. F. Livermore, of 85 Pearl St., Boston, is manufacturing, under United States and Canadian patents, and placing on the market, the Shirreff shuttle check shown in the accompanying illustration. This check is particularly adapted for looms running soft filling, and looms fitted with this check can be run at a higher rate of speed than otherwise. Its use will also show a great saving in repairs.

The check will not run with a loose binder, or a bound one, but must be run as if the common hard bunter were there. It can be run on skip box work of any kind, and the great saving in pickers pays for it in a short time, while 80 to 90 per cent. will run from one to two years.

To those interested, we would suggest that they correspond with the manufacturer, who we understand will be glad to send a sample pair of checks to those desiring them.

Flood and Tempest in the South.

Our readers are already familiar with the widespread damage to Southern textile mills, resulting from a cloudburst in South Carolina and the tornado at Gainesville, Ga., last June. The accompanying illustrations of the scenes before and after the disaster, give the reader as nothing else now can, an idea of the full force of the elements. With characteristic Southern enterprise immediate steps were taken to repair the damage and all the mills destroyed are to be rebuilt, in some instances the location being changed in order to prevent a recurrence of the recent disaster. We are indebted for these illustrations to Mr. Edward Atkinson, President of the Boston Manufacturers' Mutual Fire Insurance Company.

FIG. 1—NO. 3 MILL, CLIFTON MANUFACTURING CO. BEFORE THE FLOOD.

At the time of the disaster in South Carolina the representative of the Mutual Company, Macy S. Pope, was in the neighborhood, and made a thorough inspection of the property damaged by the flood, and from his report made to the Company we take the following extracts:

"On Saturday, June 6, rain had fallen intermittently for a week and the ground was thoroughly saturated, the streams running bank full on Friday evening, June 5. All Friday night an unusually heavy rain fell, from the Georgia line northeastward into North Carolina, reaching from the Blue Ridge Mountains eastward from twenty-five to fifty miles. At Spartanburg five and one-fourth inches are said to have fallen in eighteen hours prior to Saturday morning; and at Henrietta, just over the line in North Carolina, five and one-half inches are said to have fallen in nine hours. Although there were no other rain gauges in the flooded area, it is highly probable that the rain-fall in and near the mountains was even greater than that recorded. Early Saturday morning, all the rivers in Western South Carolina had overflowed their banks. At Clifton, on the Pacolet River, where are located the three mills of the Clifton Manufacturing Company, with their warehouses, store and dwellings, the water, already high, began rising very

rapidly about four o'clock in the morning, and within not over two hours had risen twenty feet above ordinary high water. This great flood, rising so rapidly and sweeping down the steep and narrow valley of the Pacolet, did an immense amount of damage to property and caused the loss of about fifty lives.

"The mill furthest up stream was the Clifton Manufacturing Company No. 3, shown at Fig. 1. The main building was 496 by 103 feet, four stories high, and contained 50,000 spindles. This great mill was completely washed away, together with the boiler house, wheel house, and engine room. As the flood rose, it first reached the wheel house and boiler house, which gradually crumbled away. When the wall at the upper end of the main mill building gave way, it allowed the force of the current, with the drift stuff carried with it, to pass into the mill, and an eye witness states that the whole mill went down nearly at once, and the cloud of dust rising from the crumbling brickwork was so thick that it could not be told just how it fell. Fig. 2 shows the foundations of the mill, as they appeared after the flood subsided. There were eight boilers at this plant and all of these excepting one were carried down stream by the flood. The writer saw one on the river bank about one-fourth of a mile below the mill. The water was five feet deep in the second story of the picker house, which remained uninjured on higher land.

FIG. 2—NO. 3 MILL, CLIFTON MAUFACTURING CO. AFTER THR FIRE.

"The next mill was Clifton No. 1, about three-fourths of a mile below. The main building here is three stories high, 408 by 72 feet, and contained 23,000 spindles. The current did not strike this building squarely, but about one-third of the upper end crumbled and fell. The wheel house and the weave shed, a building 120 by 70 feet, were completely washed away. Fig. 4 shows the building after the flood, about one-third of the main mill having been destroyed. The water was four and one-half

feet deep in the second story. The first story of this mill was filled with sand and debris to the top of the rooms, and a large amount of drift stuff caught in the shafting. The appearance of this room can best be understood by looking at Fig. 5. Twelve tenements were washed away between mills Nos. 3 and 1.

"The No. 2 mill of the Clifton Manufacturing Company was located about three-fourths of a mile below No. 1. The main building here was four stories high, 262 by 99 feet, and contained about 28,000 spindles. The water completely surrounded this building, rising to a depth of two inches in the third story. One-quarter of the up-stream end of the main building was destroyed, together with the drawing-in building, machine shop, wheel house, engine and boiler house, and a portion of the picker house wall. Below the mill were the one-story warehouses, having seven compartments in all, which were washed away with their contents. The general store, which stood above the mill, was also carried away, together with about forty tenements that stood on the flat lands above and below the mill. It was here that the great loss of life occurred, the houses being carried off in the flood before the people could escape. The appearance of this mill after the flood is shown at Fig. 6.

FIG. 4—NO. 1 MILL, CLIFTON MANUFACTURING CO. AFTER THE FLOOD.

"The Pacolet Manufacturing Company's mills Nos. 1 and 2 formed one four-story building, 493 by 74 feet, separated into two nearly equal parts by a brick wall. These mills contained 28,000 spindles. A clean sweep was made of mills 1 and 2, together with the boiler house and a portion of the walls of picker house and cloth room.

Fig. 7 the river can be seen flowing where

the main mill stood, and the height of water can be noted by the dark shade on the end of the remaining portion of the cloth room

"Just below the mill was a ten-compartment warehouse which contained 4,000 bales of cloth and 3,000 bales of cotton. This warehouse was completely destroyed and a large part of the contents carried down river. Some of the cotton was caught under the falling walls and buried by sand. At the time of the writer's visit, this cotton was being recovered, and some of the cotton which had drifted down river and lodged along the shores was being picked up. A church and a few smaller buildings near the warehouse were also carried away. A cotton gin, grist mill, and small saw mill on the opposite side of the river, and belonging to the Pacolet Manufacturing Company, were swept from foundations, nothing but a water wheel remaining where these buildings once stood.

"Number 3 mill of the Pacolet Manufacturing Company, located about one-half mile below Nos. 1 and 2, is a five-story building, 388 by 102 feet, and contains 32,000 spindles. The boiler house and engine room were destroyed, and about one-third of the picker house end of the main building was wrecked. The appearance of this building after the flood is shown at Fig. 8. The water here reached a depth of eighteen inches in the second story. The first story was filled with sand to about the level of the top of the cards and looms. The water swept down through the yard in the space between the mill and high wall, apparently first washing out the greater part of the earth in the yard, and afterwards filling it up in some places to a greater depth with sand and rubbish.

FIG. 5.—WEAVE ROOM OF MILL NO. 1, CLIFTON MANUFACTURING CO. AFTER THE FLOOD.

"In addition to the mills above mentioned, there were a number of others on other streams which were more or less damaged,

but were not visited by the writer. At the Glendale Mill, on Lawson's Fork, a branch of the Pacolet, the dam was completely carried away, and some of the low buildings considerably damaged. The Whitney Mill, further up on Lawson's Fork, was also injured. At Newry, the Courtenay Manufacturing Company lost a portion of their storehouse and some cotton.

FIG. 6—NO. 2 MILL, CLIFTON MANUFACTURING CO. AFTER THE FLOOD.

"It is evident that practically all of the heavy rainfall of the night before the flood ran off, a large part of it reaching the river early Saturday morning. The flood did not come down the valley like a wall of water, as some supposed, but, for the last twenty feet of rise, came up rapidly in less than two hours, sometimes in waves said to be from one to two feet high. Just below Pacolet Nos. 1 and 2, the water reached a depth of thirty-two feet above ordinary summer stage, according to the writer's measurement, and at Pacolet No. 3, the water, as measured on the smokestack, showed a height of twenty-one feet above the crest of the dam. The river valley in this vicinity is from 300 to 400 feet wide. The Broad River, into which the Pacolet empties, is said to have been at only ordinary freshet stage, which would indicate that only a few of its tributaries were unusually high. The destructiveness of the flood was due largely to the great velocity of the water. In this steep river valley the water at ordinary stages has only a moderate velocity, but with the greater depth at the time of this freshet, the friction of the water on the bottom and sides of this channel retarded the water proportionately much less, consequently the velocity was very high. The force of the current is shown by its moving boilers and other heavy machinery to a considerable distance down stream, and also from the fact that at Clifton No. 2 there are several rocks, some of them

approximately two cubic yards in volume, which were dislodged from the ledge one-third of a mile above the mill, and carried along the bottom of the stream until they dropped over the dam."

The week previous to the Pacolet flood the Gainesville Cotton Mills at Gainesville, Ga., were damaged by a tornado which struck the town about noon, June 1st. Our illustration, Fig. 9, is taken from a point looking east; the storm moved from south to north, and at the point shown by the illustration the force of the wind was from east to west. The fifth floor was carried away with the exception of the belt and the stair tower at the north end. The third and fourth stories were damaged only on the west side as seen in this illustration. The windows on the east side were not broken by the wind. A few of them were broken by gravel stones blown from the roof of the storehouse which was southeast of the main mill.

A peculiar freak of the wind was removing the cap from the tank and leaving the tank standing uninjured, as shown in the illustration.

Fig. 10 shows the remains of the tenements belonging to the Pacolet Co.'s No. 4 mill at New Holland, Ga. The area covered with debris was occupied with double tenements like the damaged one in the background. In all about forty tenements were completely destroyed, converted into kindling wood, as shown in the illustration; forty more were damaged. Many of the damaged ones were moved from their foundations, swung partly around and badly wrenched. Those that stood in the path of the storm were literally blown to pieces, and the debris scattered by the wind as if it had been pieces of paper. About forty lives were lost in the Gainesville disaster, which is probably unparalleled in the history of textile mills.

FIG. 8—NO. 3 MILL, PACOLET MANUFACTURING CO. AFTER THE FLOOD.

FIG. 9.—THE GAINESVILLE COTTON MILLS, GAINESVILLE, GA. AFTER THE TORNADO.

FIG. 10—THE REMAINS OF THE TENEMENTS, PACOLET CO., NEW HOLLAND, GA. AFTER THE TORNADO.

Textile Machinery in the United States.

The American textile industry, according to statistics compiled from the Textile World Record Directory for 1903, recently issued, has made a substantial increase in its machinery during the past year. No branch shows a decrease, but the most striking growth has taken place in the cotton branch in which 1,086,154 new spindles have been added during the past year, bringing the total number of cotton spindles in the United States up to 24,154,856. This is equal to 51 per cent. of all the cotton spindles in Great Britain; 71 per cent. of the number on the Continent of Europe, and about 22 per cent. or nearly one-quarter of all the spindles throughout the world.

When we consider the consumption of cotton which this increase represents, the showing is still more impressive. Assuming that the rate of consumption by the new is the same as by the old spinning machinery, the growth last year means an increase of 220,000 bales in the consumption of cotton by American cotton mills. Combined with a stationary cotton crop and an increased demand for cotton from abroad this goes far to explain the present high prices for this raw material. It should be remembered that the increase in American cotton spindles has been in response to a home demand for goods, consequently the 220,000 bales is just so much withdrawn from the supply of American cotton for foreign consumption.

Nearly 70 per cent. of last year's new cotton spindles were installed in the South. This shows plainly that the exceptional advantages possessed by this section of the country still attract capital. The 30 per cent. increase scored by the rest of the country (principally by New England) proves no less clearly that the Northern cotton industry is still vigorous and progressive. Taken together they stand out in strong contrast to the stationary state of the British cotton industry which, dependent on America for raw material and with the cheapest market in the world for selling the finished product, appears to be on the verge of a decline.

During the past year the cotton looms increased in number somewhat faster than the spindles. This is a gratifying feature and cannot fail to benefit the cotton yarn market by restoring an equilibrium which had become disarranged by a disproportionate development in the spinning branch. The new looms were divided as to locality in about the same proportion as were the spindles, 62 per cent. of the former being found in the South.

The increase in the woolen branch of textile manufacturing has been almost entirely in the Northern States. Of the new woolen cards, all but 11 were installed in New England and the Middle States. 1,459 looms, or 1.6 per cent., were added to the woolen and worsted weaving machinery. Of this number 1,369, or 80 per cent., were set up in New England and the Middle States, thus increasing still further the lead which these localities already possessed in the manufacture of woolen and worsted goods.

The knitting industry exhibits an increase of 11,480 knitting machines for last year. This is at the rate of 10 per cent. yearly which if maintained, would double the capacity of the knitting mills in about seven years. Nearly 70 per cent. of the new knitting machines were set up in the Middle States, attracted to that centre by a law of gravitation that is due in great measure to the presence of experienced help. Only 3.6 per cent. of the new knitting machinery was installed in the Southern States; 19.1 per cent. in New England, leaving 10.4 per cent. for the Western States.

The same story of progress is told by the silk industry. The new silk looms started during the past year numbered 4,360, an increase of 7 1/2 per cent. Of this number all but 50 were located in New England and the Middle States. The last named section alone claims 2,794 of them, or 64 per cent. Before this increase, the United States led all other countries in the consumption of raw silk, and the growth of last year bids fair to put us still further in the lead. The silk industry in foreign countries shows no such development.

COMPARISON OF TEXTILE MACHINERY IN 1903 WITH 1902.

	1902	1903	INCREASE	PER CENT
Cotton Spindles	22,968,702	24,154,856	1,186,154	5.1
Cotton Looms	527,457	564,632	37,175	7.0
Woolen Cards	6,397	6,693	296	4.6
Wool and Worsted Looms	87,073	88,532	1,459	1.6
Worsted Combs	1,539	1,612	83	5.3
Knitting Machines	84,555	96,035	11,480	10.0
Silk Looms	58,072	62,432	4,360	7.5

WOOL AND WORSTED LOOMS.

States	1902	1903	Increase
New England	45,316	45,901	585
Middle States	33,995	34,779	784
Southern	3,064	3,092	28
Western	4,698	4,760	62
	87,073	88,532	1,459

WORSTED COMBS.

States	1902	1903	Increase
New England	839	865	26
Middle States	670	721	51
Southern	3	7	4
Western	27	29	2
	1,539	1,612	83

KNITTING MACHINES.

States	1902	1903	Increase
New England	14,890	17,083	2,193
Middle	46,527	54,216	7,689
Southern	9,557	9,965	408
Western	13,581	14,771	1,190
	84,555	96,035	11,480

SILK LOOMS.

States	1902	1903	Increase
New England	3,524	5,040	1,516
Middle	52,330	55,124	2,794
Southern	1,775	1,775	0
Western	443	493	50
	58,072	62,432	4,360

COTTON SPINDLES.

States	1902	1903	Increase
New England	13,856,064	14,173,867	317,803
Middle	1,849,387	1,921,460	72,073
Southern	6,895,299	7,720,677	825,378
Western	367,952	338,852	29,100 dec.
	22,968,702	24,154,856	1,186,154

COTTON LOOMS.

States	1902	1903	Increase
New England	320,190	333,702	13,512
Middle	37,347	37,579	232
Southern	162,149	185,271	23,122
Western	7,771	8,080	309
	527,457	564,632	37,175

WOOLEN CARDS.

States	1902	1903	Increase
New England	3,465	3,644	179
Middle	21,024	2,130	399
Southern	258	267	9
Western	650	652	2
	6,397	6,693	589

In France it is practically stationary, while reports from Swiss silk mills state that a large part of the machinery is idle because of the falling off in orders from foreign countries.

The accompanying tables, giving the statistics of our textile industry for the past two years, tell a story of prosperity that is full of promise for the future. It shows the practical results of confining the domestic market to domestic industries. Abroad we see low wages and business depression. At home we find high wages and prosperity. A few months ago we called attention to the fact that in the consumption of cotton goods 80,000,000 Americans were equal to 600,000,000 foreigners. It is a fair supposition that the same ratio of consumption exists in all other branches of textile industry. On this basis 30 per cent. of the world's textile products are consumed in the United States. This magnificent market rests upon a foundation of high wages which are in turn maintained by a policy of protection against the products of cheap foreign labor. These are the supports of an industrial system which is now enjoying the prosperity of which our Directory statistics tell the short but eloquent story.

ADVERTISING TEXTILE FABRICS. WILL IT PAY?

(Continued.)

III.—COST OF ADVERTISING.

Supposing an advertiser should decide to use in a few of the leading magazines an average of 56 lines, equivalent to a quarter page in the monthlies of standard size like Munsey's, twelve times during the first year, that is three full pages divided into large space during certain periods of the twelve months and small space at other times. Taking somewhat at random a few of the leading magazines, we have:

Ladies' Home Journal	$4,032.00
Woman's Home Companion	1,344.00
Munsey's Magazine	1,350.00
Cosmopolitan	1,075.20
McClure's Magazine	1,036.80
Review of Reviews	600.00
Harper's Magazine	600.00
Total	$10,038.00

This is a formidable list of magazines. With striking copy and good follow-up literature, these publications should evolve an advertising campaign of no mean proportions. When desired the list could be greatly enlarged and the space increased, or the cost could be reduced or modified by the use of mediums with smaller circulation and bona fide rates in proportion. Changes in the list for each advertiser would unquestionably be advisable because of his peculiar proposition; as a mill selling dress goods direct would probably want McCall's Magazine while a sweater could be advertised in Outing. The magazines with smaller specialized circulations having rates in proportion to circulation could be advantageously substituted whenever the advertiser has a proposition appealing to a special class of readers. Indefinite modification is possible, and any one of various methods will lead to success, provided only that reasonable sized copy is used, and a campaign once started is carried out with energy and persistence.

An Unusual Offer
A Linen Pillow Cover with a very attractive design. A pair of strong embroidery hoops, and four skeins of silk to work the design with.
All for
25c
For an outlay of 25 cts. and a little agreeable work you may secure a pillow that any lady would be proud to display in her home, worth from Five to Ten Dollars anywhere.
OUR HINTS ON EMBROIDERY, ALSO PREMIUM LIST, containing information valued by all ladies, sent for two-cent stamp.
The Silk is
POTTER'S BRAIDED WASH SILK
No better is made, fast colors, all shades, works with unusual smoothness and convenience, made in exact needle lengths, no thread to cut or tangle. It is kept in perfect condition, convenient and neat until the last thread is used, being put up in POTTER'S PATENT HOLDER.
Ask your dealer for this silk; if he hasn't it ask him to get it; if he refuses send us his name and address with your own and we will send direct to you, and then convince the dealer that it is to his interest to carry POTTER'S WASH SILK.
WINSTED SILK CO.
Art Dept., 254 Franklin Street Chicago, Illinois

FIG. 1.

A well directed campaign in one paper alone is far superior to a number of scattered and halting efforts in many papers. It is the claim of the Woman's Home Companion, for instance, that it has started many advertisers who are now using big lists of magazines, having built up their business along advertising lines through the Woman's Home Companion alone.

SILK COMPANY'S CLEVER SCHEME.

As an illustration of successful advertising on a very moderate scale, we reproduce herewith an advertisement of the Winsted Silk Co. (Fig. 1) which ran last winter in comparatively small copy and only for a brief season. This, manager Leonard said, was a highly successful advertisement. The plan was simply to get Potter's silk into the hands of the consumers in order to establish a leverage on the dealers. The four skeins of silk sold with the pillow cover were of a peculiar kind, so that the lady who had been embroidering with it was induced to go to her dealer and demand more of Potter's silk if she wanted to finish the pillow cover. The concluding paragraph of the advertisements sums up frankly what the company wanted: "Ask your dealer for this silk; if he hasn't it ask him to get it; if he refuses send us his name and address with your own and we will send direct to you, and then convince the dealer that it is to his interest to carry Potter's wash silk."

To make an advertisement of this character effective, no prolonged hammering away at a name was required. Neither would

it have been absolutely necessary to use more than a single good magazine, as the results depended upon individual inquiries. The expense of the whole advertising campaign was comparatively small.

On the other hand, a similar advertising campaign, conducted by the Richardson Silk Co., cost as much in the first year as the total operating expense of many a textile mill. This concern spent a fortune advertising a cozy corner, showed how the material was to

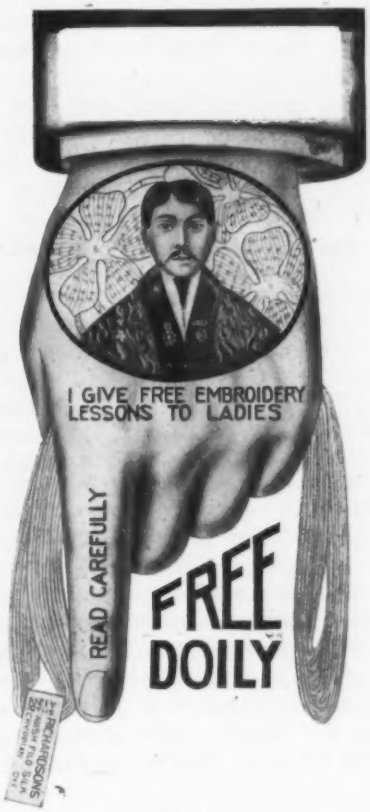


FIG. 2.

be arranged and prepared. When a woman decided to have one of these cozy corners in her home, the next thing was to get some of Richardson's silk. The advertisement reproduced herewith (Fig. 2) shows this firm's clever scheme which, like the Potter silk advertisement, is limited in its scope almost entirely by the money the advertiser chooses to spend. The cut tells the essential point and the advertisement as it appeared in the magazines explained further that a Japanese professor would give free embroidery lessons by mail to users of Richardson's silks. A number of things in addition are offered free, including a doily, designs, etc. All that the prospective customer is asked to do is to send twelve empty spools of Richardson's silks or she may send ten cents in stamps.

Such an advertisement as this is a powerful appeal to all women interested in embroidery. Here and there in all parts of the country women reply to the advertisement; next they go to their dry-goods store and demand Richardson's silk. Each individual reply to the advertisement creates an individual campaign to interest some dealer somewhere in the products of this mill.

Publicity advertising of quite a different character is that found in the announcements of the majority of manufacturers. The underwear people have gone almost entirely on the theory of pure publicity, keeping the name before the people, hammering away persistently by illustrations, by trade names in conspicuous type, and by pertinent arguments until the readers have been influenced to believe that they must have this and not some other brand of underwear from their dry-goods store. The accompanying cut of the Lewis Knitting Co. (Fig. 3), illustrates this. This figure of either a man or a woman, or both, holding up a union suit of underwear goes with every announcement. It is the one unchanging, characteristic feature of their otherwise extremely varied and generally unique advertising work.

The point here is simply that this type of announcement, as can readily be seen, requires considerable time and money to begin to show effects. The effect when produced is lasting and widespread, but it cannot be gainsaid that scheme advertising directed to particular localities, particular classes of consumers, or interested parties who are to act as a lever on the dealers, may be carried out successfully on a much smaller scale.

In concluding the consideration of cost of advertising, we can pretty safely say that what a campaign will cost depends almost entirely upon what we want to make it cost. Textile mills especially can afford to start with small outlays as they have no competi-

tors using anything like the enormous space of soap, food product or patent medicine houses.

The main guarantee of success is the continuance of an advertising policy once inaugurated. The start should be made on a scale sufficiently moderate to insure the continuance of advertising along the original lines through at least the first dull and up to the second brisk season. By that time, according to practically universal experience, the advertiser should reap his reward.

But those whose capital is too limited to permit of even a small expenditure continued for some time without adequate results, had

FIG. 3.

better refrain from advertising. Definite appropriations should be made and they should be taken from the current surplus, not from the profits expected from the advertisements. This is the consensus of judgment of practically all conservative advertising men.

Finally, the reader will no doubt agree that while advertising may be started on a small scale, mere *dabbling* in publicity schemes, advertising when one is "too busy" to look after it, will never be found profitable. The manufacturer of textiles whose business offers a practically unlimited market, should not invest anything in advertising unless he invests enough in proportion to his business to make it worth his while to give the subject systematic attention. Once begun, the advertising should be developed with a view to increasing the business just as far as the results and the capital of the concern will justify. In other words, the manufacturer should undertake his advertising, if he undertakes it at all, in the same spirit with which he would enter upon the establishment of an important branch of his business.—E. T. Gundlach, 115 Dearborn St., Chicago.

The Textile Exports of England.

According to the English Board of Trade, there has been a large shrinkage in the exports of English cotton and woolen goods, exclusive of yarns, in the thirty years from 1872 to 1902. Following are the figures:

	1872	1902	Decrease
Woolen goods ..	$142,370,000	$ 45,975,000	67%
Cotton goods	215,270,000	184,335,000	14%

Much of this decrease in woolen goods is only apparent and doubtless due to the decrease in the level of values. No figures are given as to the quantity of goods exported, which in 1902 bears a much larger proportion to the value than in 1872. Before concluding that English supremacy in the export of textile products is waning, it will be necessary to have the weight or yardage as well as the value of the goods exported in each of these years.

Fast Black on Cotton. Chas E. Wild, Lansdowne, Pa., is introducing a new black for cotton goods which he styles "A Fast Fast Black." It is said to be much superior to any other fast black in use. An account of the new method will be found in another part of this issue.

The first cotton mill in the United States in which power looms were used was started at Waltham, Mass., in 1813.

TEXTILE PROCESSES.

EDITED BY E. A. POSSELT.

THE COMBING OF COTTON.

Combing is a process which is introduced in the spinning of high counts of yarn of the best quality and is a method of dealing more in detail with the fibres in order that the resulting sliver shall contain fibres of practically uniform length and laid in parallel order to one another, all fibres which do not approximate the required length being rejected. In the operation of carding the process is continuous, while in combing the process is intermittent, only small portions of the lap being dealt with separately and in succession.

ITS CHIEF PURPOSE.

Its chief purpose is to separate from the carded sliver all fibres that are below the length it has been decided to use, and at the same time effectually clear the cotton from all impurities not removed by the carding engine. By the use of the comber, cottons formerly unsuited for the production of fine yarns can now be used.

The sliver when coming from the carding engine, is massed together in such a manner that it would be impossible to subject these slivers direct to the comber as the needles of the comber would be considerably damaged, and the irregularity of the sliver would also be reproduced in the comber and cause a waste of good fibres.

Another reason why the slivers from the card can not be fed direct to the comber is that since the fibres are combed out by a series of needles arranged in rows from 7 to 11 inches wide, the slivers must be made into an even and uniform lap. In order to get such a lap the fibres composing the sliver are sometimes first subjected to a drawing frame which partially parallelizes them and are then taken and passed through a sliver lap machine which forms the slivers into a lap, besides subjecting them to a drawing action. The objection to this method is that thick and thin places predominate in the direction of its length, caused by the slivers from the draw-frame not being incorporated with each other sufficiently by the sliver lap machine, but simply lying more or less side by side. The needles of the comber consequently can not act evenly on the width of lap thus formed and as a result more waste is produced. In order to get a lap in which such thick and thin places do not occur the usual practice is to run the sliver from the card direct to the sliver lap machine and then put a number of these laps on a ribbon lapper. This subjects the laps to a draft so that they assume the form of a thin ribbon and are laid one on another to form a combined lap. This is passed through a series of calender rolls which consolidates the lap and neutralizes any tendency to lick when unwound at the comber.

AT THE SLIVER LAP MACHINE.

At the sliver lap machine the lap is formed by running from 12 to 16 card or drawing frame slivers, as the case may be, through guides to a set of three drawing rolls arranged with a slight draft. From these rolls the slivers pass between calender rollers which press the fibres and form them into a fleece which is wound on a roller driven by friction. The lap thus formed, if a drawing frame has been previously used, should be 8 3/4 inches wide and is taken direct to the comber; but if the drawing frame is not used, these laps should be made 7 1/2 inches wide in order to allow for the spread in drawing when passed through the ribbon lapper. A stop motion device is applied to each sliver at the feed end of the sliver lap machine which acts to stop the machine if a sliver breaks so that a uniform lap is produced; a full lap stop motion or measuring device being also applied in order to regulate the size and weight of laps. If a drawing frame is used and the laps from the sliver lap machine are in consequence fed direct to the comber, four sets of

drawing rolls used in the latter machine in place of three sets as previously mentioned will give a better lap.

In the use of the ribbon lapper the laps from the sliver lap machine are placed at the back of the machine and each is passed in its full width through four sets of drawing rolls which reduce the laps in thickness until they become like a thin ribbon. This drawing process acts to pull the fibres into as parallel an order as possible and the ribbons are then passed over curved brass guide plates which guide the slivers evenly on top of each other on a long plate extending the whole length of the machine. As the ribbons are drawn along this plate they pass through several press rolls and are then passed to the lap head and compressed into a lap ready for the comber.

This superimposing of the six webs or ribbons, one upon the other, gives a lap which is absolutely even in section so that all the fibres are firmly held by the comb rippers during the operation of combing and only a minimum amount of waste is produced.

With reference to the action of the comb itself, the fibres are first held at their rear ends while their forward ends are combed and afterward their rear ends are drawn through the teeth of another comb, each individual fibre being thus combed at both ends. Thus any impurities yet in the cotton are taken out as well as all short fibres below a standard length.

For the very best yarn it is sometimes considered advisable to comb the cotton twice. When this is done the method generally adopted is as follows:

When a ribbon lap machine is used, the cotton is passed through the following machines in their order: 1, Sliver lap machine. 2, Ribbon lap machine. 3, Comber. 4, Sliver lap machine. 5, Ribbon lap machine. 6, Comber.

If double combing is resorted to without the ribbon lapper, the order of the machines is as follows: 1, Draw frame. 2, Sliver lap machine. 3, Comber. 4, Draw frame. 5, Sliver lap machine. 6, Comber.

In double combing a system is sometimes adopted as follows: 1, Sliver lap machine. 2, Comber. 3, Sliver lap machine. 4, Comber.

As mentioned before, the sliver lap machine unites the slivers from the carding and forms them into a lap. In forming a lap, 12 or 16 card slivers are placed in cans at the back of the machine, each sliver being led up through a guide and passed under a round bar, to and over a spoon lever which forms a part of a stop motion. From this spoon lever the slivers pass down a specially shaped guide plate which keeps each sliver apart from the others in a separate groove or channel. By means of the guide plate the slivers are converged and guided in a comparative level sheet to a set of three drawing rolls which subject said slivers to a slight draft and form a lap sheet of them, which is then compressed between a pair of calender rolls and wound on a wooden bobbin into a lap, by frictional contact with two fluted rollers.

The edges of the lap are kept from swelling out by large, smooth plates placed at each end of the bobbin to revolve with it. The laps made on this machine must be perfectly uniform, for which reason a back stop motion is provided for each sliver which stops the machine instantly on the breaking of an end, another stop motion being used at the front which stops the machine when a roll reaches its full diameter, thus insuring the laps to be of a uniform length.

When the slivers pass properly over the spoons the opposite ends are held out of engagement of a vibrating knife bar, which is constantly rocked by an eccentric on one end of a double fulcrum lever. This lever is adapted to open out at its middle so that when a sliver breaks, the opposite end of the spoon drops and the movement of the double fulcrum lever is arrested, the continued movement of the eccentric causing the front half of said lever to lift up. Over the front half of this lever is extended a catch finger which is connected by rods to the belt shifter, thus when the double fulcrum lever rises it will release the catch finger and allow the spring on the rod to move said rod in the direction of the belt fork and through the lower rod act to shift the belt and stop the machine.

The front stop motion consists in placing on the rack which exerts a pressure on the lap, a knock off stud which can be set according to the size of lap required. When the rack has been raised by the formation of the

lap to the definite height, the knock off stud engages the end of a rod and presses it back against the action of its spring, the other end of said rod engaging the lower arm of a bell crank lever, which causes its upper arm to lift up the catch finger and thus stop the machine in the same manner as explained in connection with the back stop motion.

(To be continued.)

FANCY COTTON DRESS GOODS DESIGNS.

FANCY EFFECTS PRODUCED BY CHANGING WARP TEXTURE IN THE DESIGN.

This principle of designing weaves for cotton dress goods fabrics is closely related to the designing for matelasses, piques, etc., and where a raised effect is produced for the figure by interlacing the filling only with two-thirds of the warp threads, the remaining warp threads (one-third) floating on the back of the structure.

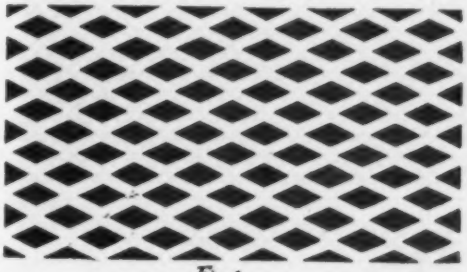


Fig. 1

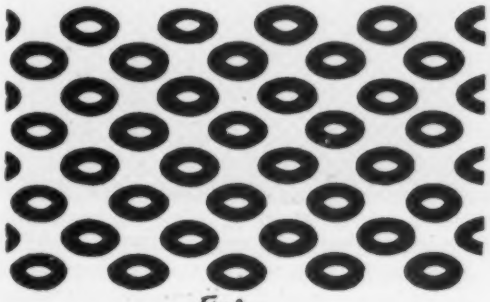


Fig. 3

It will be readily understood that by means of this change of texture, an endless amount of new designs can be produced either by means of the harness or jacquard loom.

HARNESS WORK.

For explaining the present system of designing, the accompanying four sketches of fabrics and their respective four weaves are given:

Of the same, diagram Fig. 1 shows a "diamond effect" pattern set after the "plain" motive. Its complete weave, Fig. 2, repeats on 36 warp threads and 24 picks, and can be woven on 9 harness, although it will be advisable, provided the capacity of the loom permits it, to draw the plain weaving warp threads on 4 harness in place of 2 harness, and when in this instance 11 harness would be required for the execution of the weave.

Examining the latter, as well as any one of the other three weaves given, will readily explain the principle of the designing observed in connection with this class of weaves showing that every third warp thread is arranged, according to the design, to float at certain intervals on the back of the structure, in turn producing a characteristic raised effect on the face of the fabric, as where pure plain weaving is done with all the warp, the fabric will get an imbedded, or lowered appearance.

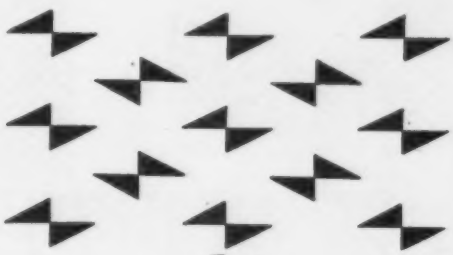


Fig. 5

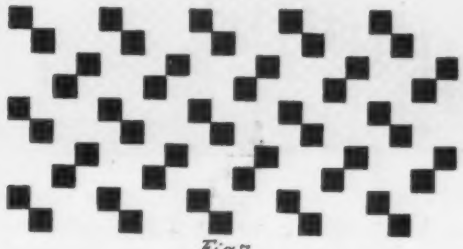


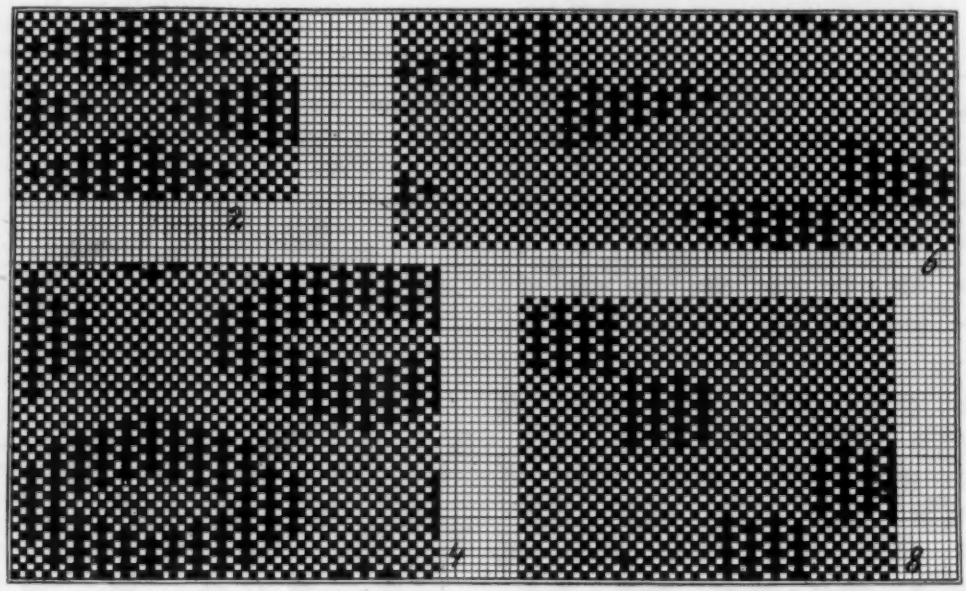
Fig. 7

Diagram Fig. 3 shows a neat oval link, arranged as a design for a dress fabric, the fabric being set after the "plain" motive. Its

complete weave, Fig. 4, repeats on 54 warp threads and 40 picks and can, by means of its respective fancy draw, be woven on 12 harness.

Diagram Fig. 5 shows a star effect, set after the "plain" motive. This design shows more ground effect compared to the former examples, and as seen from its weave, Fig. 6, requires for its execution 72 warp threads and 30 picks; the lowest number of harness required for its execution being 26.

Diagram Fig. 7 has for its motive a square set after the "four harness broken twill" motive, calling for its execution, as is readily seen by consulting weave Fig. 8, 48 warp threads and 36 picks. The lowest number of harness for the execution of this weave is 10 harness.



AN IMPROVEMENT TO THE CROMPTON & KNOWLES TUFTED FABRIC LOOM.

In the construction of these looms a series of beams are carried by an endless chain, said beams having the tuft-yarns wound thereon. A series of carriages are connected with said beams and are provided with a series of quills or yarn-carriers for the individual tuft yarns. The beams and carriages are taken from the chain one at a time by transferring arms and the quills inserted into the shed to form the tufts in the fabric.

The present improvement consists in having the tuft-yarn beam and carriage carrying the quills when they reach their lowest position at the lower end of the endless chains preparatory to being removed therefrom, held firmly and prevented from any swinging motion. By this means the spring arms on the carriage, which engage a link of the endless chains to connect the carriage therewith, will be in position to be engaged properly by the releasing-fingers on the transferring-arms in order to allow of the disengagement of said spring-arms from the links of the endless chains and the removal of the beam and carriage from the chain by the transferring-arms.

In order to explain better the construction of the new mechanism the accompanying illustrations are given of which Fig. 1 is an end view of a loom-frame, showing a portion of the endless chain with one tuft-yarn beam and carriage attached thereto and at its lowest position on the chain, having the improvements combined therewith, the lower part of the sprocket-wheel being shown broken away in order to show details required to be seen to

get a clear understanding of the construction and working of the improved device. Fig. 2 is a front view of the upper part of the loom shown in Fig. 1, looking in the direction of arrow a, same figure, and showing also the sprocket-wheels for the upper part of the endless chains carrying the tuft-yarn beams and carriages. Numerals of references accompanying the illustrations indicate thus: 1 is the loom-frame; 2 are hangers supported on

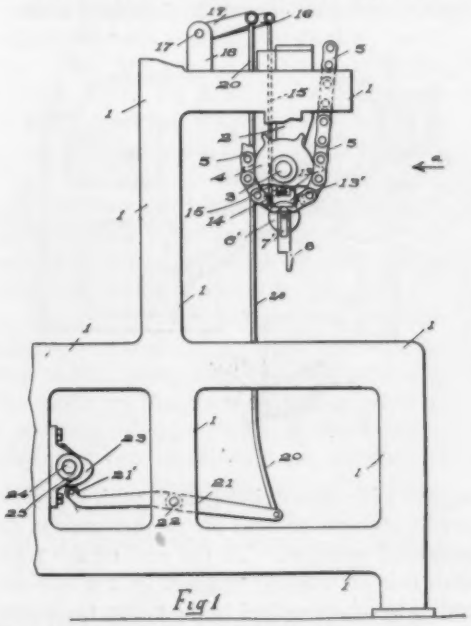


Fig 1

the loom-frame and having at their lower ends journals 2^1 for the shaft 3, having fast on each end a sprocket-wheel 4, around which passes the lower end of the two endless chains 5, carrying a series of tuft-yarn beams 6 and carriages 7, carrying quills or tuft-yarn carriers 8, which are detachably connected at each end with the endless chains 5 by the spring-arms 7^1. The endless chains 5 at their upper ends pass over sprocket-wheels 9, fast on the shaft 10, mounted in hangers 11.

The construction of the new device:

On the lower ends of the hangers 2 are formed two inwardly-projecting arms 12, having pivotally attached to their ends a clamp lever 13, with its clamp end grooved, as shown at 13^1, Fig. 1, to engage the upper part of the rounded ends 6^1 of the tuft-yarn beam 6. A coil spiral spring 14 is confined between each supporting-arm 12 and the clamp-arm 13 and acts to force down the arms 13 on to the edge of the enlarged ends 6^1 of the tuft-yarn beams 6. To a projection on the outer end of each clamp-arm 13 is pivotally the lower end of a link or connector 15, the upper end of which is pivotally connected to a crank-arm 16, fast on a rock-shaft 17, mounted in bearings 18 on the frame 1. A third crank-arm 19 is also fast on the shaft 17 and is pivotally connected, through a connector 20, to one end of a centrally-pivoted lever 21, pivoted to a stud 22 on the loom-frame 1 (see Fig. 1). The other end of said lever 21 has a roll 21^1 thereon, which is adapted to engage the periphery of the cam 23, fast on the driven shaft 24, mounted in bearings 25 on the loom frame. The spring 14, through intermediate connections, acts to hold the roll 21^1 on the lever 21 in engagement with the periphery of the cam 23. The operation of the new device:—

The periphery of the cam 23 is so shaped that through intermediate connections the clamp-levers 13 are positively raised to disengage them from the ends of the tuft-yarn beams during the revolution of the endless chains, said chains having a regular intermittent motion; but when the endless chains are stationary, preparatory to removal of the tuft-

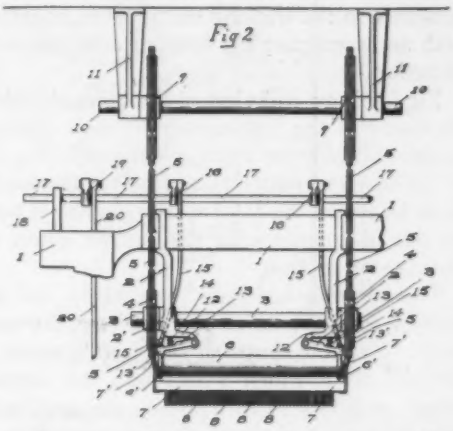


Fig 2

yarn beams and carriages from the endless chains by the transferring-arms (not shown) the clamp levers 13 are moved down through the action of the springs 14 to engage the upper surface of the rounded ends of the tuft-yarn beam and hold them firmly and prevent

any movement thereof and of the carriage preparatory to the engagement of the releasing-fingers on the trasferring-arms with the spring-arms on the carriage. The clamp-levers 13 have a spring-actuated movement to clamp and hold the ends of the tuft-yarn beams and are positively raised to allow of the free passage thereunder of the tuft-yarn beam on the movement of the endless chains and preparatory to engaging the ends of another beam.

IMPROVED TAKE-UP MOTION FOR WHITIN LOOMS.

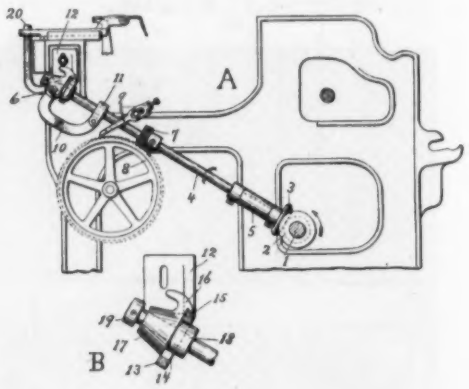
Thin places are often made in the cloth during weaving due to the fact that the take-up motion continues in operation for a brief space of time after the filling fork has detected the absence of filling in the shed. The object of the new mechanism is to arrest automatically the cloth take-up as soon as the absence of filling in the shed is detected by the filling fork.

In order to understand the complete working of the mechanism, illustrations are given, showing the principal working parts in relation to each other, and their positions with reference to the framing of the loom, together with an accompanying detailed description of its action.

Fig. A is an end view of the loom showing the parts of the mechanism in their correct positions while the loom is running. Fig. B is a side view, partly in section, of the latch-head by which the take-up mechanism is held up out of contact with the ratchet wheel of the take-up motion.

The motion consists essentially in an oblique shaft driven at one end from the cam shaft. Near the centre of its length a worm is fastened to it which works into the ratchet wheel, and this in turn drives the sand roll. The other end of the shaft is supported by a bracket which is attached to the rock shaft, so that when the filling breaks and the rock shaft is partly rotated, the oblique shaft is raised, causing the worm to disengage the ing of the new stretching rollers is best given ratchet wheel, and so arrest the take-up of the cloth.

Referring to Fig. A, 1 is the cam-shaft, to the end of which is secured the bevel-gear 2. Meshing into 2 is the gear 3 fixed on the end of the oblique shaft 4. This end of the oblique shaft is held in position by the sleeve 5, the bracket which holds it being journaled on the cam shaft. The oblique shaft 4 extends from the cam-shaft 1 toward the rock-shaft 6 and has secured to it the worm 7, placed so as to



engage with the ratchet-gear 8, with which the pawl 9 engages to hold the ratchet-gear in the advanced position. To the end of the rock-shaft 6 is secured the bracket 10, the opposite end of which is jointed to the collar 11, around the shaft 4, but loose on the same. On the end framing at the breast-beam is secured the bracket 12, the arm 13 of which is provided with the elongated opening 14 (see Fig. B). The edge 15 is beveled, so as to engage with the hook 16 of the latch-head 17; the stud 18 which is attached to it being provided with flattened sides and extends through the elongated opening 14 in the arm 13.

The shaft 4 extends through the latch-head 17 with a loose sliding fit. The collar 19 is secured to the end of the shaft 4.

When the parts are in the normally operative positions (shown in Fig. A) and the loom is running, the worm 7 is in engagement with the ratchet-gear 8, which controls the rotation of the sand-roll and consequently the take-up of the cloth. The worm securely locks the ratchet-gear, so that it cannot be moved by

hand, as is the case when the ratchet gear 8 is operated by a reciprocating pawl mechanism in which the take-up mechanism may be and at times is operated by hand to secure a surreptitious gain of cloth. When now a shuttle fails to lay the required pick, the filling fork is carried backward by the snake head and by means of the regular levers, shifts the belt from the fast to the loose pulley. At the same time that the fork goes backward it pushes the arm 20 out, and this arm being attached to the rock shaft 6, causes it to partly rotate. The bracket 10, rocking with the rock-shaft, raises the shaft 4 and disengages the worm 7 from the ratchet-gear 8, which is, however, held in the advanced position by the pawl 9. The hook 16 on the latch head 17, having been brought higher than the edge 15, slides down over it thus securing the shaft in the raised position, with the worm 7 out of contact with the ratchet gear 8.

By this arrangement the take-up mechanism is disconnected at the same time with the release of the spring-shipper and the take-up of the cloth or the warp instantly arrested. The weaving of thin places in the cloth is avoided and the laborious back winding of the warp and cloth unnecessary. On releasing the latch-head 17 the worm engages with the ratchet-gear 8 and continues to take-up the cloth as it is woven.

IMPROVEMENTS TO FINISHING MACHINERY.

(Continued from June.)

AN IMPROVED CONSTRUCTION OF ROLLERS FOR STRETCHING FABRICS.

The novelty in the construction of these stretching rollers consists in the fact that their curvature can be readily varied to suit different fabrics and that the number of such rollers to be used in each machine can be varied.

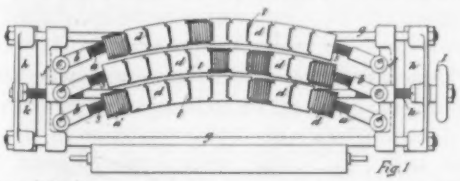


Fig 1

A description of the construction and working by quoting letters of references accompanying our illustrations of which Fig. 1 is a plan of three stretching-rollers and Fig. 2 an end view.

Examining the illustrations we find a number of steel bars a, rectangular in section, held side by side in end sockets b, there being strung upon the bars a number of sleeves c, which have square holes to fit loosely on the bars and are externally circular. On these sleeves are mounted so as to turn freely short rollers d, each externally grooved (only some of them being thus shown grooved in Fig. 1, all those on the right of the middle roller having their ridges sloped to the one hand, and all those on the left of the middle roller having their ridges sloped to the other hand, the middle roller being sloped according to those on either side of it), so as to present furrows and ridges of ratchet shape, in turn tending to draw the fabric from the middle toward the selvages, thus stretching it in the direction of its width. The short rollers d also have their ends interlocked by clutch teeth t and are passed toward

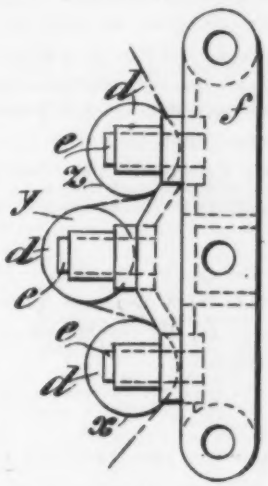


Fig. 2

each other by springs s. The sockets b are made with eyes which fit on pins e, projecting up from two frames f, which are fitted to slide on a pair of bars g, which connect two end frames h. In these frames is mounted a screw-spindle k, having right and left hand threads which engage in the frames f, as in

nuts, and can be turned by a handle-wheel l, so as to move the frames f nearer to or farther from one another. As the bars a are bent and somewhat flexible in the horizontal direction, this movement of the frames gives a greater or less degree of curvature, as may be found necessary for their proper action on fabrics of various kinds, the fabric being drawn in the usual way under the first bent roller x, over the middle roller y, and under the third roller z (see Fig. 2).

CALCULATIONS FOR MIXINGS.

TO FIND THE PERCENTAGE OF A CERTAIN MIXING.

When different materials and quantities are required, use

RULE:—Add all the lots, divide the sum by each lot separately, divide 100 by these separate quotients, add these smaller quotients together, subtract their sum from 100, and the percentage of the largest lot is obtained. One example will suffice to render this rule clear.

EXAMPLE:—Suppose we used in a mixture 400 lbs. of wool, 150 lbs. of waste, 60 lbs. of shoddy, and 40 lbs. of cotton. Required the percentage of each item used. The sum of all items is 650 lbs., then

650 lbs.÷150= 4.3 and 100÷ 4.3 =23.25% waste.
650 lbs.÷ 60=10.83 and 100÷10.83= 9.2 % shoddy.
650 lbs.÷ 40=16.25 and 100÷16.25= 6.15% cotton.

38.60

38.60 is the sum of the smaller lots in percentages; now from 100 take 38.60 and that equals 61.40, i.e., the percentage of the wool in above example.

PROOF:—61.40+38.60=100, i.e., the total percentage of the lot.

TO FIND THE PRICE PER POUND OF A MIXTURE.

RULE:—Multiply the quantity of each quality by its price and divide the sum of the products by the sum of the quantities; the quotient will be the mean rate or price.

EXAMPLE:—20 lbs. Wool	at 55 c. per lb.=	$11.00
20 lbs. Wool	at 38 c per lb.=	7.60
15 lbs. Noils	at 25 c. per lb.=	3.75
15 lbs. Shoddy	at 13 c. per lb.=	1.95
30 lbs. Cotton	at 11 c. per lb.=	3.30
100 lbs. weight of lot.		$27.60

$27.60÷100=27⅜ cts., price of above mixture per pound.

TO FIND THE WEIGHT OF EACH COLOR FOR A BATCH PROVIDED PERCENTAGE GIVEN.

RULE:—Multiply each item of percentage with total weight of mix and divide product thus obtained by 100.

EXAMPLE:—Suppose a mixture of 1,500 lbs. is made, containing 60 per cent. black, 30 per cent. blue and 10 per cent. brown.

1,500×60÷100=900 lbs.; 1,500×30÷100 =450 lbs.; 1,500×10÷100=150 lbs.

The mix in question thus consisting of 900 lbs. black,
450 lbs. blue and
150 lbs. brown.

PROOF:—1500 lbs.

VALUE OF SUITABLE OILS FOR LUBRICATING COTTON SPINDLES.

Spindles possess two parts requiring oiling; the first is the footstep, and the second the bolster. The first is a part of the spindle itself,—cup shaped and kept filled with oil, allowing the spindle to run with a constant supply of oil, but the bolster is the principal bearing in a spindle and upon it devolves the pressure and weight. The spindle may revolve from 5,000 revolutions up to 12,000. The spindle itself, being light, does not contribute much to the pressure on the bolster and footstep. The driving belt is the main object in contributing the pressure on all bearings and may be any weight according to tension—the smaller it is, the less power is needed to run the spindles, if the steam power is sufficient in strength. Owing to the high speed with which many spindles revolve, the proper oil to use must be one of low viscosity; others lead to an increase of engine power, so that what is saved at one end is lost at the other.

Scientists have never yet agreed whether dyeing is the result of a chemical or mechanical action, nor why some varieties of dyes will stick by simply being poured over a fabric while others will color only those that have been previously prepared with a mordant.

HINTS ON TEXTILE CALCULATIONS.

The size of cotton, woolen and worsted yarns, technically known as their "counts" or numbers are based upon the number of yards of the respective yarns required to balance 1 lb. avoirdupois. The number of yards thus necessary to balance 1 lb. varies for cotton, wool and worsted yarn, and are respectively known as their standard numbers. The finer in diameter the respective yarn gets the higher its count or number.

COTTON YARNS

have for their standard number 840; by tha we mean that 840 yards of cotton yarn equal 1 hank and that the number of hanks thus required to balance 1 lb. equals the counts or number of the yarn under consideration. For this reason

1 cotton yarn = 840 × 1 = 840 yards per lb.
2 cotton yarn = 840 × 2 = 1,680 yards per lb.
3 cotton yarn = 840 × 3 = 2,520 yards per lb.

Continuing in this manner, always adding 840 yards for each successive number, will readily give us the number of yards of yarn for any number of cotton yarn under consideration.

WOOLEN YARNS

are either graded by the "run" or the "cut" system. With reference to the run system the standard is 1,600 thus:—

1 run woolen yarn = 1,600 × 1 = 1,600 yards per 1 lb
2 run woolen yarn = 1,600 × 2 = 3,200 yards per 1 lb.
3 run woolen yarn = 1,600 × 3 = 4,800 yards per 1 lb.

Continuing in this manner always adding 1,600 yards for each successive run (or number) will readily give us the number of yards of yarn required for it to balance 1 lb. Besides whole numbers (as used in connection with all other yarns only) we find in practical work, on account of the extremely long measure of the run basis and this in connection with the difference in its nature and construction as compared to other yarns, fractions of a run used. In this manner we find the run standard of 1,600 divided into halves, quarters and eighths respectively, viz:—

$\frac{1}{8}$ run = 1,600 ÷ 8 = 200 yards per lb.
$\frac{1}{4}$ run = 1,600 ÷ 4 = 400 yards per lb.
$\frac{3}{8}$ run = $\frac{1600}{8}$ × 3 = 600 yards per lb.
$\frac{1}{2}$ run = 1,600 ÷ 2 = 800 yards per lb.
$\frac{5}{8}$ run = $\frac{1600}{8}$ × 5 = 1,000 yards per lb.
$\frac{3}{4}$ run = $\frac{1600}{8}$ × 3 = 1,200 yards per lb.
$\frac{7}{8}$ run = $\frac{1600}{8}$ × 7 = 1,400 yards per lb.

In this manner considering for an example a complex number as count of a certain woolen yarn we find:—

$2\frac{1}{2}$ run to equal 1,600 × $2\frac{1}{2}$ = 4,000 yards per lb.
$3\frac{3}{4}$ run to equal 1,600 × $3\frac{3}{4}$ = 6,000 yards per lb.
$5\frac{7}{8}$ run to equal 1,600 × $5\frac{7}{8}$ = 9,400 yards per lb.

In other words, multiplying the counts of the yarn under consideration, may it be a fraction only, a whole number or a complex number, with 1,600 will give us the number of yards of said yarn required to balance 1 lb. with reference to woolen yarn graded by the cut system, we find their standard for grading as to counts or number to be 300 yards per lb. In this manner we find

1 cut to equal 300 yards per lb.
2 cuts to equal 300 × 2 = 600 yards per lb.
3 cuts to equal 300 × 3 = 900 yards per lb.

Continuing in this manner, always adding 300 yards for each successive number or count of the yarn, will readily give us the number of yards of yarn required to balance 1 lb.

WORSTED YARNS

have for their standard measure 560 yards. Thus:—

1 worsted yarn = 560 × 1 = 560 yards per lb.
2 worsted yarn = 560 × 2 = 1,120 yards per lb.
3 worsted yarn = 560 × 3 = 1,680 yards per lb.

Continuing in this manner, always adding 560 yards for each successive number will always in turn give us the number of yards of yarn required for any number of worsted yarn under consideration.

Having thus far given a thorough explanation of the grading as to counts of cotton, woolen and worsted yarns, the solving of the few examples herewith quoted will greatly assist the student in mastering the subject:

QUESTION 1.—Ascertain the number of yards of yarn required to balance 1 lb. for 10's, 18's, 30's and 80's cotton yarn; $4\frac{1}{2}$, $2\frac{7}{8}$, $1\frac{3}{4}$ and $6\frac{1}{4}$ run woolen yarn; 8, 15, 22 and 32 cut woolen yarn; 12's, 18's, 24's and 40's worsted yarn.

QUESTION 2.

If 30,240 yards of cotton yarn weigh 1 lb., what is its number?

If 16,800 yards of cotton yarn weigh 1 lb., what is its number?

If 23,520 yards of cotton yarn weigh 1 lb., what is its number?

If 50,400 yards of cotton yarn weigh 1 lb., what is its number?

If 3,600 yards of woolen yarn weigh 1 lb., what is its number (run basis)?

If 4,800 yards of woolen yarn weigh 1 lb., what is its number (run basis)?

If 10,800 yards of woolen yarn weigh 1 lb., what is its number (run basis)?

If 9,200 yards of woolen yarn weigh 1 lb., what is its number (run basis)?

If 5,100 yards of woolen yarn weigh 1 lb., what is its number (cut basis)?

If 10,800 yards of woolen yarn weigh 1 lb., what is its number (cut basis)?

If 4,500 yards of woolen yarn weigh 1 lb., what is its number (cut basis)?

If 2,400 yards of woolen yarn weigh 1 lb., what is its number (cut basis)?

If 6,720 yards of worsted yarn weigh 1 lb., what is its number?

If 8,960 yards of worsted yarn weigh 1 lb., what is its number?

If 15,680 yards of worsted yarn weigh 1 lb., what is its number?

If 22,400 yards of worsted yarn weigh 1 lb., what is its number?

Yarns are frequently manufactured into 2-ply in which instance, *provided the minor threads are of equal count*, the number of yards required for one pound is one-half the amount called for in the single thread. Thus a 2-ply 30's cotton (technically written 2/30's) equals (30 ÷ 2) single 15's cotton = 12,600 yards per lb. In the same manner a 2-ply 6 run woolen yarn (technically written 2-ply 6 run d and tw.) equals (6 ÷ 2), 3 run in single yarn = 4,800 yards per lb. With reference to woolen yarn-cut system we thus find that a two-ply 30 cut, woolen yarn = single 15 cut or 4,500 yards per lb. is its count. Considering worsted yarn we thus find that 2-ply 40's worsted (2/40's) equals single 20's worsted or has 11,200 yards per lb.

If the yarn under consideration be more than 2-ply, divide the number, or count of the minor threads by the number of ply used, the answer being the equivalent counts in single yarn of the compound thread.

Consequently 3-ply 60's cotton (3/60's) = 60 ÷ 3 = 20's cotton = 16,800 yards per lb.

Again 4/72's cotton = 72 ÷ 4 = 18's or 18 × 843 = 15,120 yards per lb.

With reference to woolen yarn-run system we thus find that a 3-ply 6 run d. and tw. thread equals (6 ÷ 3) a 2 run single thread or 3,200 yards per lb. If the cut-system is the system of grading used, 3-ply 30 cut means 30 ÷ 3 = single 10 cut or (10 × 300 =) 3,000 yards per lb,

Considering the affair in worsted yarn, we find that 3/48's worsted equals 48 ÷ 3 = 16's in single yarn = (16 × 560) 8,960 yards per lb.

Having thus far given the grading of two or more ply yarn composed of minor threads of equal counts, we next have to turn our attention to *two or more ply yarn, composed of minor threads of unequal counts.* In such a case two different methods of calculations may be pursued to obtain the result, i. e., the equivalent of the ply yarn in its equal compound single thread, viz :—

RULE A: Divide the product of the counts of the minor threads by their sum; or

RULE B: Divide one of the counts by itself and by the others in succession, and afterwards by the sum of the quotients. Both rules will give the same result, which to use is left to the option of the manufacturer. To prove the accuracy of the above we will solve examples by both rules.

QUESTIONS.—Find the equal in single yarn (or compound thread) to a two-fold cotton yarn composed of 40's and 60's minor threads.

Considering Rule A, we proceed thus: 40 × 60 = 2,400 ÷ 100 (40 + 60) = 24's compound size = (24 × 840) 20,160 yards per lb. Considering Rule B, we obtain the same result thus :—

60 ÷ 60 = 1
60 ÷ 40 = 1½
2½ and 60 ÷ 2½ = 24.

Considering the rules given, with reference to a 3-ply yarn, ascertain the compound size and its number of yards of yarn per lb. for a 3-ply cotton thread composed of 20's, 40's and 60's.

By Rule A the procedure will be thus :—
20 × 40 = 800 ÷ 60 (20 + 40) = 13⅓, and

$13\frac{1}{3} \times 60 = 800 \div 73\frac{1}{3}$ $(13\frac{1}{3} + 60) = 10\ \frac{10}{11}$'s compound size = 9,163 yards per lb.

By Rule B the example is readily proven thus:—

$60 \div 60 = 1$
$60 \div 40 = 1\frac{1}{2}$
$60 \div 20 = 3$

$5\frac{1}{2}$ and $60 \div 5\frac{1}{2} = 10\frac{10}{11}$'s compound size = $(10\frac{10}{11} \times 840)$ 9,163 yards per lb.

Next let us consider woolen yarn-run system:—

QUESTIONS.—Find compound thread and yards per lb. for a d. and tw. yarn composed of 4 and 6 run.

By RULE A: $4 \times 6 = 24 \div 10$ $(4 + 6) = 2\frac{2}{5}$ run compound size = 3,840 yards per lb.

By Rule B, (or Proof.)

$6 \div 6 = 1$
$6 \div 4 = 1\frac{1}{2}$

$2\frac{1}{2}$ and $6 \div 2\frac{1}{2} = 2\frac{2}{5}$.

Considering a 3-ply woolen yarn composed of 3, 6 and 8 run we obtain its compound thread thus:

By Rule A: $3 \times 6 = 18 \div 9$ $(3+6) = 2$ and $2 \times 8 = 16 \div 10$ $(2 + 8) = 1\frac{3}{5}$ compound size = $(1\frac{3}{5} \times 1{,}600)$ 2,560 yards per lb.

By Rule B. (Proof.)

$8 \div 8 = 1$
$8 \div 6 = 1\frac{1}{3}$
$8 \div 3 = 2\frac{2}{3}$

5 and $8 \div 5 = 1\frac{3}{5}$.

In order not to neglect the "cut" basis of grading woolen yarn which is extensively used in Philadelphia and vicinity as well as in the West, compared to the run basis which is exclusively used in New England, we in turn will proceed with an example on the former basis:—Ascertain compound thread and its yards per lb. for a 2-ply d. and tw. woolen thread composed of 30's and 36's cut minor threads.

Following Rule A, $30 \times 36 = 1{,}080 \div 66$ $(30 + 36) = 16\frac{4}{11}$ compound size = $(16\frac{4}{11} \times 300)$ $4{,}909\frac{1}{11}$ yards per lb.

Following Rule B:

$36 \div 36 = 1$
$36 \div 30 = 1\frac{1}{5}$

$2\frac{1}{5}$ and $36 \div 2\frac{1}{5} = 16\frac{4}{11}$.

Considering cut basis with reference to a 3-ply woolen yarn, the following example will explain the subject.

QUESTIONS.—A 20, 30 and 36 cut minor thread being twisted together, find the compound size and its number of yards per lb.

$20 \times 30 = 600 \div 50 = 12 \times 36 = 432 \div 48$ = 9 compound size of 3-ply yarn in question = 2,700 yards per lb.

Proof. (Rule B):

$36 \div 36 = 1$
$36 \div 30 = 1\frac{1}{5}$
$36 \div 20 = 1\frac{4}{5}$

4 and $36 \div 4 = 9$.

With reference to 2 or 3 ply in worsted yarn the following examples will suffice:

QUESTIONS.—Ascertain compound thread for a 2 fold worsted thread composed of 40's and 48's minor threads.

$40 \times 48 = 1{,}920 \div 88 = 21\frac{9}{11}$ compound size of yarn in question = 12,218 yards per lb.

Proof. (Rule B):

$48 \div 48 = 1$
$48 \div 40 = 1\frac{1}{5}$

$2\frac{1}{5}$ and $48 \div 2\frac{1}{5} = 21\frac{9}{11}$.

Taking a 3-ply worsted thread, composed of 20's, 40's and 60's minor threads, into consideration the compound thread is found thus:

$([(20 \times 40) - 60] \times 60) \div 73\frac{1}{3} = 10\frac{10}{11}$ compound thread = $6{,}109\frac{1}{11}$ yards per lb.

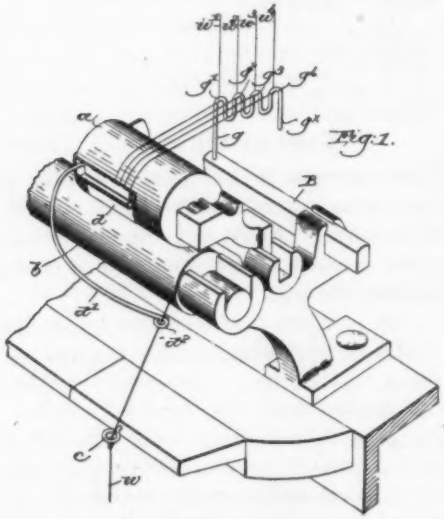
Proof. (Rule B):

$60 \div 60 = 1$
$60 \div 40 = 1\frac{1}{2}$
$60 \div 20 = 3$

$5\frac{1}{2}$ and $60 \div 5\frac{1}{2} = 10\frac{10}{11}$.

The twisting of 2 or more minor threads in one compound thread is done on a machine known as a twister. A novel device for guiding the minor threads in their travel from the spools on the creel frame to the delivery rolls of the machine, has been recently placed on the

market by the Draper Company, of Hopedale, Mass. The purpose of this new guide is to separate and in that shape guide the minor threads of a set of threads to be twisted in one compound thread, as they pass from the spools on the creel frame to the delivery rolls, so that the attendant can see at a glance whether or not all of the threads of the set are running properly, i.e., whether the minor threads of the set of threads to be twisted in one compound final thread is complete, and thus if one thread breaks he can promptly piece it up. The guide also causes the threads to be delivered uniformly to the rolls, so that the twist is more



uniform then where the threads of the set are delivered collectively. The accompanying illustration is a perspective view of a sufficient portion of a twister to show clearly the application of the new guide thereto. The new thread-guide, which is shown arranged in the illustration to co-operate, for example, with a set of four minor threads, is made of stout wire, comprising an upright straight shank, g, bent laterally at its upper end to form a head, the head being corrugated or crimped in the direction of its length to present a series of down-turned open loops or eyes, g^1, g^2, g^3, g^4, or as many loops as are necessary according to the number of minor threads to be twisted in one compound thread and separated from each other by the intervening oppositely-turned loops. The end of the wire at the extremity of the head is extended downward, as at g^x, below the corrugations to form a species of guard which prevents any possible slack minor thread from leaving the guide, should it slacken sufficiently to swing down out of its proper eye. The shank, g, is secured in upright position in the transverse bar B behind the rolls, one of the guides being located back of each top roll for the set of threads passing thereto.

QUESTIONS ON CALCULATIONS.

First.—Give compound count and number of yards per lb. for 2/80's cotton, 2-ply $6\frac{1}{2}$ run woolen, 2-ply 32 cut woolen and 2/42's worsted yarn respectively.

Second.—Give compound count and number of yards of yarn per lb. for 3/80's cotton, 3-ply $7\frac{1}{4}$ run woolen, 3-ply 28 cut woolen and 3/36's worsted yarn respectively.

Third.—Give compound count and number of yards of yarn per lb. for each of the following examples:

2-ply cotton yarn composed of 28's and 32's minor threads;

2-ply woolen yarn composed of 5 and 6 run minor threads;

2-ply woolen yarn composed of 28 and 32 cut minor thread;

2-ply worsted yarn composed of 52's and 60's minor threads;

3-ply cotton yarn composed of 32's, 36's and 40's minor threads;

3-ply woolen yarn composed of $5\frac{1}{4}$, $5\frac{1}{2}$ and 6 run minor threads;

3-ply woolen yarn composed of 30, 36 and 40 cut minor threads;

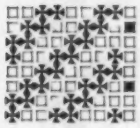
3-ply worsted yarn composed of 40's, 48's and 50's minor threads;

4-ply cotton yarn composed of 60's, 60's, 40's and 30's minor threads.

Pina cloth is a thin, soft fabric made of the fibre of the leaves of the pineapple plant. It is produced chiefly by the natives in the East Indies, who weave it on hand looms and make textures of exceeding fineness and strength.

NOVELTIES FROM FOREIGN SOURCES.

Worsted Suiting.



Complete Weave.
Repeat 9 × 8.

Warp :—4,400 ends, 9 harness straight draw.

Reed :—15 { 1 dent @ 4 ends. / 1 dent @ 5 ends. } = 65 inches wide in loom.

Dress :—

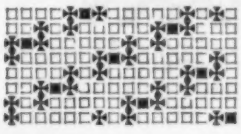
2 ends, 2/48's worsted, black
2 ends, 2/48's worsted, grey } × 2 = 8 ends.
1 end, 100/2's Chappé Silk, white = 1 end.

Repeat of pattern: 9 ends.

Filling :—70 picks per inch, all plain, 2/48's worsted, black.

Finish :—Worsted finish, scour well, shear clear, 56 inches wide.

Worsted Suiting.



Complete Weave.
Repeat 16 × 8.

Warp :—9,072 ends. 16 harness straight draw.

Reed :—17½ × 8 = 65 inches wide in loom.

Dress :—

1 end, 2/250's Chappé Silk pearl = 1 end.
3 ends, 2/60's worsted, black and pearl twist = 3 ends.
1 end, 2/60's worsted, black = 1 end.
3 ends, 2/60's worsted, black and pearl twist = 3 ends.
1 end, 250/2's Chappé Silk pearl = 1 end.
1 end, 2/60's worsted, black and pearl twist = 1 end.
6 ends, 2/60's worsted, black
2 ends, 2/60's worsted, black and pearl twist
1 end, 2/60's worsted, dark drab } × 3 = 6
1 end, 2/60's worsted, black and drab twist } × 2 = 32 ends.
2 ends, 2/60's worsted, black and pearl twist
6 ends, 2/60's worsted black = 6 ends.
1 end, 250/2's Chappé Silk pearl = 1 end.
1 end, 2/60's worsted, black and pearl twist = 1 end.
1 end, 2/60's worsted, red = 1 end.
1 end, 2/60's worsted, black and drab twist = 1 end.
1 end, 2/60's worsted, black = 1 end.
1 end, 2/60's worsted, black and drab twist = 1 end.
1 end, 2/60's worsted, green = 1 end.
1 end, 2/60's worsted, black and drab twist = 1 end.
1 end, 250/2's Chappé Silk, pearl = 1 end.
1 end, 2/60's worsted, black and pearl twist = 1 end.
6 ends, 2/60's worsted, black
2 ends, 2/60's worsted, black and pearl twist
1 end, 2/60's worsted, dark drab } × 3 = 6
1 end, 2/60's worsted, black and drab twist } × 2 = 32 ends.
2 ends, 2/60's worsted, black and pearl twist
6 ends, 2/60's worsted, black = 6 ends.

Repeat of pattern: 96 ends.

Filling :—68 picks per inch, all plain 2/60's worsted, black.

Finish :—Worsted finish, scour well, shear clear, 56 inches wide.

Worsted Trousering.

Complete Weave.
Repeat 8 × 4.

Warp :—6,346 ends, 8 or 16 harness straight draw.

Reed :—24 × 4 = 66 inches wide in loom.

Dress :—

1 end, 2/64's worsted, black = 1 end.
1 end, 200/2's Chappé Silk pearl = 1 end.
3 ends, 2/64's worsted, black = 3 ends.
1 end, 200/2's Chappé Silk pearl = 1 end.
1 end, 2/64's worsted, black = 1 end.
1 end, 2/64's worsted, light slate
3 ends, 2/64's worsted, black } × 2 = 16 ends.
1 end, 2/64's worsted, medium slate
3 ends, 2/64's worsted, black
1 end, 2/64's worsted, light slate = 1 end.
1 end, 2/64's worsted, black = 1 end.
1 end, 2/64's worsted, medium slate
1 end, 2/64's worsted, black
1 end, 2/64's worsted, light slate } × 2 = 8 ends.
2 ends, 2/64's worsted, black
2 ends, 2/64's worsted, black = 2 ends.
1 end, 2/64's worsted, medium slate = 1 end.
3 ends, 2/64's worsted, black = 3 ends.
1 end, 2/64's worsted, light slate = 1 end.
3 ends, 2/64's worsted, black = 3 ends.
1 end, 2/64's worsted, medium slate = 1 end.
3 ends, 2/64's worsted, black = 3 ends.
1 end, 2/64's worsted, light slate = 1 end.

Repeat of pattern: 48 ends

Filling :—62 picks per inch, all plain 2/64's worsted, black.

Finish :—Worsted finish, scour well, shear clear, 56 inches wide.

Worsted Suiting (Stripe Effect.)

Complete Weave.
Repeat 4 × 4.

Warp :—4,075 ends, 8, 12, or 16 harness straight draw.

Reed :—15½ × 4 = 65½ inches wide in loom.

Dress :—

1 end, 2/48's worsted, white = 1 end.
1 end, 2/48's worsted, black
1 end, 2/48's worsted, black and orange twist
1 end, 2/48's worsted, black
1 end, 2/48's worsted, black and pearl twist
1 end, 2/48's worsted, black } × 3 = 24 ends.
1 end, 2/48's worsted, black and green twist
1 end, 2/48's worsted, black
1 end, 2/48's worsted, black and pearl twist
1 end, 2/48's worsted, black = 1 end.
1 end, 2/48's worsted, black and orange twist = 1 end.
1 end, 2/48's worsted, black = 1 end.
1 end, 2/48's worsted, black and pearl twist = 1 end.
1 end, 2/48's worsted, black = 1 end.
1 end, 2/48's worsted, black and green twist = 1 end.
1 end, 2/48's worsted, black = 1 end.

Repeat of pattern: 32 ends.

Filling :—60 picks per inch, all plain 2/48's worsted, black.

Finish :—Worsted finish, scour well, shear clear, 56 inches wide.

Worsted Melton Suiting.

Complete Weave.

Repeat 4 × 4.

Warp :—3,862 ends.

Reed :—14 × 4 = 69 inches wide in loom.

Dress :—

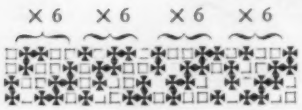
1 end, 2/36's worsted, black and white twist..... = 1 end.
1 end, 2/36's worsted, black..... = 1 end.
1 end, 2/52's worsted, black and pearl twist, twisted with 2/64's worsted, black.....
1 end, 2/52's worsted, black and red twist, twisted with 2/64's worsted black..... } × 5 = 10 ends.
1 end, 2/36's worsted, black and white twist..... = 1 end.
1 end, 2/36's worsted, black..... = 1 end.
1 end, 2/52's worsted, black and pearl twist, twisted with 2/64's worsted, black.....
1 end, 2/52's worsted, black and orange twist, twisted with 2/64's worsted, black..... } × 5 = 10 ends.

Repeat of pattern: 24 ends.

Filling :—60 picks per inch, all plain 2/36's worsted, black.

Finish :—Worsted-Melton finish, scour well, clip on shear steam and press, 56 inches wide.

Cheviot Worsted Suiting.



Complete Weave.

Repeat 100 × 4.

Warp :—3,174 ends, 8 harness fancy draw.

Reed :—24 { 1 dent @ 1 / 12 dents @ 2 } = 68¾ inches wide in loom.

Dress :—

1 end, 2/52's worsted black, twisted with 2/70's cotton, white..... = 1 end.
1 end, 2/32's worsted cheviot, brown
1 end, 2/32's worsted cheviot, black and white twist..... } × 2 = 4 ends.
1 end, 2/32's worsted cheviot, brown
1 end, 2/32's worsted cheviot, brown and drab twist..... } × 3 = 6 ends.
1 end, 2/32's worsted cheviot, brown
1 end, 2/32's worsted cheviot, black and white twist..... } × 3 = 6 ends.
1 end, 2/32's worsted cheviot, brown
1 end, 2/32's worsted cheviot, brown and drab twist..... } × 3 = 6 ends.
2 ends, 2/32's worsted cheviot, brown... = 2 ends.
} × 3 = 75 ends.
1 end, 2/52's worsted black, twisted with 2/70's cotton white..... = 1 end.
1 end, 2/32's worsted cheviot, brown
1 end, 2/32's worsted cheviot, black and white twist } × 2 = 4 ends.
1 end, 2/32's worsted cheviot, red..... = 1 end.
1 end, 2/32's worsted cheviot, brown and drab twist
1 end, 2/32's worsted cheviot, brown..... } × 2 = 4 ends.
1 end, 2/32's worsted cheviot, brown and drab twist..... = 1 end.
1 end, 2/32's worsted cheviot, brown
1 end, 2/32's worsted cheviot, black and white twist } × 3 = 6 ends.
1 end, 2/32's worsted cheviot, olive..... = 1 end.
1 end, 2/32's worsted cheviot, brown and drab twist
1 end, 2/32's worsted cheviot, brown..... } × 2 = 4 ends.
1 end, 2/32's worsted cheviot, brown and drab twist..... = 1 end.
2 ends, 2/32's worsted cheviot, brown..... = 2 ends.

Repeat of pattern: 100 ends.

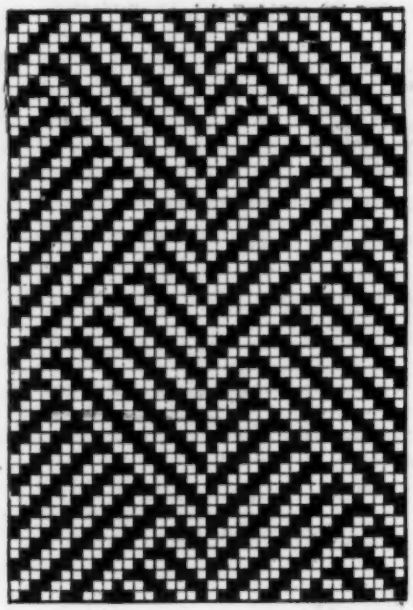
Filling :—55 picks per inch arranged thus :—

1 pick, 2/32's worsted cheviot, olive..... = 1 pick.
11 picks, 2/32's worsted cheviot, brown..... = 11 picks.
1 pick, 2/32's worsted cheviot, red..... = 1 pick.
107 picks, 2/32's worsted cheviot, brown..... = 107 picks.

Repeat of pattern: 120 picks.

Finish :—Worsted Cheviot finish, scour well, full slightly, clip on shear, 56 inches wide.

Worsted Melton Suiting.



Complete Weave.

Repeat 19 × 28.

Warp :—4,770 ends, 19 harness straight draw.

Reed :—17 × 4 = 70 inches wide in loom.

Dress :—

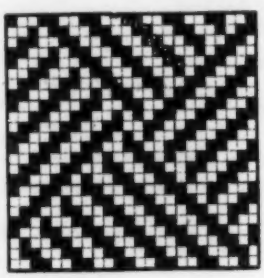
1 end, 2/60's worsted, green..... = 1 end
1 end, 2/60's worsted, black and white twist....
1 end, 2/60's worsted, gray..... } × 8 = 16 ends.
1 end, 2/60's worsted, black and white twist..... = 1 end.
1 end, 100/2's Chappé Silk, pearl..... = 1 end.
1 end, 2/60's worsted, black..... = 1 end.
1 end, 2/60's worsted, black and white twist..... = 1 end
1 end, 100/2's Chappé Silk, pearl..... = 1 end.
1 end, 2/60's worsted, gray.....
1 end, 2/60's worsted, black and white twist..... } × 8 = 16 ends.

Repeat of pattern: 38 ends.

Filling :— 72 picks per inch, all plain 2/60's worsted, black.

Finish :—Worsted Melton finish, scour well, clip on shear, steam and press, 56 inches wide.

Worsted Suiting.



Complete Weave.

Repeat 24 × 24.

Warp :—2,960 ends, 24 harness straight draw.

Reed :—22½ × 2 = 65½ inches wide in loom.

Dress :—

1 end, 2/54's worsted, black yellow and black blue mix, twisted with 2/54's worsted, white = 1 end.
1 end, single 26's worsted, black, twisted with 2-fold 2/80's cotton, white = 1 end.
2 ends, 2/28's worsted, olive red mix = 2 ends.
1 end, 2/54's worsted, black yellow and black blue mix, twisted with 2/54's worsted, white } × 6 = 24 ends.
3 ends, 2/28's worsted, olive mix }
1 end, 2/54's worsted, black yellow and black blue mix, twisted with 2/54's worsted, white = 1 end.
2 ends, 2/28's worsted, olive mix = 2 ends.
1 end, single 26's worsted, black twisted with 2-fold 2/80's cotton, white = 1 end.
} × 2 = 64 ends.
1 end, 2/54's worsted, black yellow and black blue mix, twisted with 2/54's worsted white = 1 end.
1 end, single 26's worsted, black twisted with 2-fold 2/80's cotton, white = 1 end.
2 ends, 2/28's worsted, olive red mix = 2 ends.
1 end, 2/54's worsted, black yellow and black blue mix, twisted with 2/54's worsted, white } × 2 = 8 ends.
3 ends, 2/28's worsted, olive mix }
1 end, single 26's worsted, black twisted with 2-fold 2/80's cotton, white = 1 end.
1 end, 2/28's worsted, black and blue twist = 1 end.
2 ends, 2/28's worsted, olive red mix = 2 ends.
1 end, 2/54's worsted, black yellow and black blue mix, twisted with 2/54's worsted, white = 1 end.
2 ends, 2/28's worsted, olive red mix = 2 ends
1 end, 2/28's worsted, black and blue twist = 1 end.
1 end, 2/54's worsted, black yellow and black blue mix, twisted with 2/54's worsted white } × 2 = 8 ends.
3 ends, 2/28's worsted, olive red mix }
1 end, 2/54's worsted, black yellow and black blue mix, twisted with 2/54's worsted, white = 1 end.
2 ends, 2/28's worsted, olive red mix = 2 ends.
1 end, single 26's worsted, black twisted with 2 fold 2/80's cotton, white = 1 end.

Repeat of pattern: 96 ends.

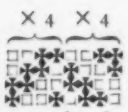
Filling :—46 picks per inch arranged thus :—

1 pick, 2/54's worsted, black and blue twist.
5 picks, 2/28's worsted, black.
1 pick, 2/54's worsted, black and blue twist.
121 picks, 2/28's worsted, black.

128 picks: Repeat of pattern.

Finish :—Worsted finish, 56 inches wide.

Worsted Melton Suiting.



Complete Weave.
Repeat 32 × 4.

Warp :—3,296 ends, all 2/48's worsted, 8 harness fancy draw.

Reed :—12 × 4 = 68¾ inches wide in loom.

Dress :—

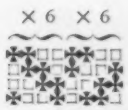
3 ends, worsted, black } × 2 = 8 ends.
1 end, worsted, black and grey twist }
2 ends, worsted, black = 2 ends.
2 ends, worsted, black and grey twist = 2 ends.
1 end, worsted, bordeaux = 1 end.
2 ends, worsted, black = 2 ends.
1 end, worsted, black and grey twist = 1 end.
3 ends, worsted, black } × 2 = 8 ends.
1 end, worsted, black and grey twist }
2 ends, worsted, black = 2 ends.
2 ends, worsted, black and grey twist = 2 ends.
1 end, worsted, green = 1 end.
2 ends, worsted, black = 2 ends.
1 end, worsted, black and grey twist = 1 end.

Repeat of pattern: 32 ends.

Filling :—48 picks per inch, all plain 2/48's worsted black.

Finish :—Worsted Melton finish, scour well, full slightly, clip on shear, 56 inches wide.

Woolen Suiting.



Complete Weave.
Repeat 48 × 4.

Warp :—3,192 ends, 8 harness straight draw.

Reed :—12½ × 4 = 64 inches wide in loom.

Dress :—

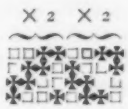
5 ends, 4 run woolen yarn, black = 5 ends.
1 end, 2/48's worsted, black and white twist = 1 end.
5 ends, 4 run woolen yarn, black = 5 ends.
1 end, 40/2's white mercerized cotton = 1 end.
5 ends, 4 run woolen yarn, black = 5 ends.
1 end, 2/48's worsted, black and white twist = 1 end.
2 ends, 4 run woolen yarn, black = 2 ends.
1 end, 2/48's worsted, black and white twist = 1 end.
2 ends, 4 run woolen yarn, black = 2 ends.
1 end, 2/48's worsted, black and white twist = 1 end.

Repeat of pattern; 24 ends

Filling :—50 picks per inch, all plain 4 run woolen yarn, black.

Finish :—Worsted finish, scour well, shear clear, 56 inches wide.

Worsted Suiting (Large Check.)



Complete Weave.
Repeat 64 × 64.

Warp :—5,410 ends, all 2/72's worsted, 16 harness fancy draw.

Reed :—20½ × 4 = 66 inches wide in loom.

Dress :—

2 ends, black and grey twist }
1 end, black }
1 end, black and grey twist }
2 ends, black } × 8 = 64 ends.
1 end, black and grey twist }
1 end, black }
1 end, black and grey twist }
1 end, black } × 22 = 44 ends.
1 end, black and grey twist = 1 end.
1 end, green = 1 end.
1 end, black and grey twist }
1 end, black } × 9 = 18 ends.

Repeat of pattern: 128 ends

Filling :—74 picks per inch, all 2/72's worsted arranged thus :—

2 picks, black and grey twist }
1 pick, black }
1 pick, black and grey twist }
2 picks, black } × 9 = 72 picks.
1 pick, black and grey twist }
1 pick, black }
1 pick, black and grey twist }
1 pick, black } × 25 = 52 picks.
1 pick, black and grey twist = 1 pick.
1 pick, green = 1 pick.
1 pick, black and grey twist }
1 pick, black } × 9 = 18 picks.

Repeat of pattern: 144 picks

Finish :—Worsted finish, 56 inches wide.

Worsted Suiting.

Complete Weave.
Repeat 6 × 6.

Warp:—4,068 ends, 12 harness straight draw.
Reed:—21 × 3 = 64½ inches wide in loom.
Dress:—

4 ends, 2/48's worsted, black.....
2 ends, 2/64's worsted, black, twisted with 2/60's white mercerized cotton..... } × 2 = 12 ends.
4 ends, 2/48's worsted, black..... = 4 ends.
1 end, 2/64's worsted, black, twisted with 2/60's white mercerized cotton..... = 1 end.
1 end, 2/64's worsted, bordeaux..... = 1 end.

Repeat of pattern: 18 ends.

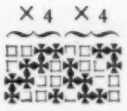
Filling:—62 picks per inch arranged thus:—

4 picks, 2/48's worsted, black.....
2 picks, 2/64's worsted, black, twisted with 2/60's white mercerized cotton..... } × 2 = 12 picks.
4 picks, 2/48's worsted, black..... = 4 picks.
1 pick, 2/64's worsted, black, twisted with 2/60's white mercerized cotton..... = 1 pick.
1 pick, 2/48's worsted, medium grey..... = 1 pick.

Repeat of pattern: 18 picks.

Finish:—Worsted finish, 56 inches wide.

Cheviot Suiting.



Complete Weave.
Repeat 32 × 4.

Warp:—2,100 ends, 8 harness fancy draw.
Reed:—15 × 2 = 68 inches wide in loom.
Dress:—

1 end, 2 ply 7 run, woolen yarn, black and red twist..... = 1 end.
2 ends, 2 ply 7 run, woolen yarn, black and white twist.. = 2 ends.
2 ends, 3 run, woolen cheviot yarn, black..... = 2 ends.
1 end, 2 ply 7 run, woolen yarn, white..... = 1 end.
2 ends, 3 run, woolen cheviot yarn, black..... = 2 ends.
1 end, 2 ply 7 run, woolen yarn, black and white twist.. = 1 end.
1 end, 3 run, woolen cheviot yarn, black..... = 1 end.
1 end, 2 ply 7 run, woolen yarn, black and white twist.. = 1 end.
1 end, 2 ply 7 run, woolen yarn, white..... = 1 end.
1 end, 3 run, woolen cheviot yarn, black..... = 1 end.
1 end, 2 ply 7 run, woolen yarn, white..... = 1 end.
2 ends, 3 run woolen cheviot yarn, black..... = 2 ends.
1 end, 2 ply 7 run, woolen yarn, black and green twist.. = 1 end.
2 ends, 2 ply 7 run, woolen yarn, black and red twist.... = 2 ends.
2 ends, 3 run, woolen cheviot yarn, black..... = 2 ends.
1 end, 2 ply 7 run, woolen yarn, white..... = 1 end.
2 ends, 3 run, woolen cheviot yarn, black..... = 2 ends.
1 end, 2 ply 7 run, woolen yarn, black and white twist.. = 1 end.
1 end, 3 run, woolen cheviot yarn, black..... = 1 end.
1 end, 2 ply 7 run, woolen yarn, black and white twist.. = 1 end.
1 end, 2 ply 7 run, woolen yarn, white..... = 1 end.
1 end, 3 run, woolen cheviot yarn, black..... = 1 end.
1 end, 2 ply 7 run, woolen yarn, white..... = 1 end.
2 ends, 3 run, woolen cheviot yarn, black..... = 2 ends.

Repeat of pattern; 32 ends.

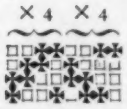
Filling:—42 picks per inch, arranged thus:—

1 pick, 2/24's worsted cheviot, black..... = 1 pick.
1 pick, 2/24's worsted cheviot, olive green..... = 1 pick.

Repeat of pattern: 2 picks.

Finish:—Cheviot finish, scour well full slightly, clip on shear, 56 inches wide.

Cheviot Suiting.



Complete Weave.
Repeat 32 × 4.

Warp:—2,916 ends, 8 harness fancy draw.
Reed:—22½ × 2 = 64½ inches wide in loom.
Dress:—

1 end, 5½ run, woolen yarn, white..
1 end, 5½ run, woolen yarn, light drab mix..... } × 2 = 4 ends.
1 end, 5½ run, woolen yarn, white..... = 1 end.
1 end, 5½ run, woolen yarn, olive red mix. = 1 end. } × 3 = 24 ends.
1 end, 5½ run, woolen yarn, white..... = 1 end.
1 end, 5½ run, woolen yarn, medium drab mix..... = 1 end.
1 end, 5½ run, woolen yarn, white..... } × 2 = 4 ends.
1 end, 5½ run, woolen yarn, light and drab mix.....
1 end, 5½ run, woolen yarn, white..... = 1 end.
1 end, 5½ run, woolen yarn, olive mix..... = 1 end.
1 end, 5½ run, woolen yarn, white..... = 1 end.
1 end, 5½ run, woolen yarn, medium drab mix..... = 1 end.
3 ends, 5½ run, woolen yarn, white.....
1 end, 5½ run, woolen yarn, light drab mix.....
1 end, 5½ run, woolen yarn, white.....
3 ends, 5½ run, woolen yarn, light drab mix.....
3 ends, 5½ run, woolen yarn, white..... } × 5 = 80 ends.
1 end, 5½ run, woolen yarn, olive red mix.....
1 end, 5½ run, woolen yarn, white.....
1 end, 5½ run, woolen yarn, medium drab mix.....
1 end, 5½ run, woolen yarn, olive mix.....
1 end, 5½ run, woolen yarn, medium drab mix.....
1 end, 5½ run, woolen yarn, white..
1 end, 5½ run, woolen yarn, light drab mix..... } × 2 = 4 ends.
1 end, 5½ run, woolen yarn, white..... = 1 end.
1 end, 5½ run, woolen yarn, olive red mix. = 1 end. } × 3 = 24 ends.
1 end, 5½ run, woolen yarn, white..... = 1 end.
1 end, 5½ run, woolen yarn, medium drab mix..... = 1 end.
1 end, 5½ run, woolen yarn, white..... } × 2 = 4 ends.
1 end, 5½ run, woolen yarn, light and drab mix.....
1 end, 5½ run, woolen yarn, white.....
1 end, 2 ply 8 run, woolen yarn, twist, white and orange..... } × 2 = 4 ends.
1 end, 5½ run, woolen yarn, white..... } × 2 = 4 ends.
1 end, 5½ run, woolen yarn, light drab mix.....
1 end, 5½ run, woolen yarn, white..... = 1 end.
1 end, 5½ run, woolen yarn, olive red mix..... = 1 end.
1 end, 5½ run, woolen yarn, white..... = 1 end.
1 end, 5½ run, woolen yarn, medium drab mix..... = 1 end.
1 end, 5½ run, woolen yarn, white..... } × 2 = 4 ends.
1 end, 5½ run, woolen yarn, light drab mix.....
1 end, 5½ run, woolen yarn, white.....
1 end, 2 ply 8 run, woolen yarn twist, white and orange..... } × 2 = 4 ends.

Repeat of pattern: 160 ends.

Filling;—50 picks per inch arranged thus:—

3 ends, 2 ply 8 run, woolen yarn twist, black and white.....
1 end, 5½ run, woolen yarn, gray.....
1 end, 2 ply 8 run, woolen yarn, twist, black and white.....
3 ends, 5½ run, woolen yarn, gray.....
3 ends, 2 ply 8 run, woolen yarn, twist, black and gray..... } × 4 = 64 ends.
1 end, 5½ run, woolen yarn, gray.....
1 end, 2 ply 8 run, woolen yarn, twist, black and gray.....
3 ends, 5½ run, woolen yarn, gray.....
3 ends, 2 ply 8 run, woolen yarn twist, black and white.. = 3 ends.
1 end, 5½ run, woolen yarn, gray..... = 1 end.
1 end, 2 ply 8 run, woolen yarn twist, black and white.. = 1 end.
3 ends, 5½ run, woolen yarn, gray..... = 3 ends.
1 end, 2 ply 8 run, woolen yarn, twist, black and gray..... } × 2 = 4 ends.
1 end, 5½ run, woolen yarn, gray.....
1 end, 2 ply 8 run, woolen yarn twist, black and white..... } × 4 = 32 ends.
1 end, 5½ run, woolen yarn, gray.....
1 end, 2 ply 8 run, woolen yarn twist, black and gray
1 end, 5½ run, woolen yarn, gray..... } × 2 = 4 ends.
1 end, 2 ply 8 run, woolen yarn twist, black and white.. = 1 end.

1 end, 2 ply 8 run, woolen yarn twist, black and orange. = 1 end.
1 end, 2 ply 8 run, woolen yarn twist, black and white.. = 1 end.
1 end, 2 ply 8 run, woolen yarn twist, black and orange.. = 1 end.
1 end, 2 ply, 8 run, woolen yarn twist, black and gray ..... } × 2 = 4 ends.
1 end, 5½ run, woolen yarn, gray.....
1 end, 2 ply 8 run, woolen yarn twist, black and white ..... } × 2 = 4 ends.
1 end, 5½ run, woolen yarn, gray.....
1 end, 2 ply 8 run, woolen yarn twist, black and gray ..... } × 2 = 4 ends.
1 end, 5½ run, woolen yarn, gray.....
1 end, 2 ply 8 run, woolen yarn twist, black and gray..... = 1 end.
1 end, 2 ply 8 run, woolen yarn twist, black and red..... = 1 end.
1 end, 2 ply 8 run, woolen yarn twist, black and white.. = 1 end.
1 end, 2 ply 8 run, woolen yarn twist, black and red..... = 1 end.
1 end, 2 ply 8 run, woolen yarn twist, black and gray..... } × 2 = 4 ends.
1 end, 5½ run, woolen yarn, gray... } ×5 = 40 ends.
1 end, 2 ply 8 run, woolen yarn twist, black and white..... } × 2 = 4 ends.
1 end, 5½ run, woolen yarn, gray...
3 ends, 2 ply 8 run, woolen yarn twist, black and gray.. = 3 ends.
1 end, 5½ run, woolen yarn, gray..... = 1 end.
1 end, 2 ply 8 run, woolen yarn twist, black and gray... = 1 end.
3 ends, 5½ run, woolen yarn, gray..... = 3 ends.

Repeat of pattern: 176 picks.

Finish:—Cheviot finish, scour well, full slightly, clip on shear, 56 inches wide.

Worsted Suiting (Silk Stripe.)

Complete Weave.
Repeat 4 × 4.

Warp:—4,920 ends, 8 or 12 harness straight draw.
Reed:—19 × 4 = 65 inches wide in loom.
Dress:—

2 ends, 100/2's Chappé Silk white..... = 2 ends.
5 ends, 2/60's worsted, black..... = 5 ends.
1 end, 100/2's Chappé Silk white..... = 1 end.
5 ends, 2/60's worsted, black..... = 5 ends.
2 ends, 100/2's Chappé Silk white..... = 2 ends.
5 ends, 2/60's worsted, black..... = 5 ends.
1 end, 2/60's worsted, black and white twist..... = 1 end.
1 end, 2/60's worsted, black..... = 1 end.
1 end, 2/60's worsted, black and white twist..... = 1 end.
5 ends, 2/60's worsted, black..... = 5 ends.
1 end, 100/2's Chappé Silk white..... } × 2 = 14 ends.
6 ends, 2/60's worsted, black.....
1 end, 100/2's Chappé Silk white..... = 1 end.
5 ends, 2/60's worsted, black..... = 5 ends.
1 end, 2/60's worsted, black and white twist..... = 1 end.
1 end, 2/60's worsted, black..... = 1 end.
1 end, 2/60's worsted black and white twist..... = 1 end.
5 ends, 2/60's worsted, black..... = 5 ends.

Repeat of pattern; 56 ends.

Filling:—77 picks per inch, all plain, 2/60's worsted, black.

Finish:—Worsted finish, scour well, shear clear, 56 inches wide.

THICKENING AGENTS FOR SIZING AND FINISHING.

Many substances have been used for the purpose of thickening colors for printing and for sizing, but of the entire list, the following will be found most generally in use.

British Gum. A product made of corn starch by roasting. It is of wide utility, especially for silk printing and the finishing of cottons.

Dextrine. This occurs in commerce as a white or yellow powder, and is made from potato starch by means of acids. The white variety contains about 50 per cent. of unchanged starch, and the yellow sort about 30 per cent., this latter being much more soluble than the former.

In actual use, the quality to use depends upon the nature of the color used, whether light or dark, or if for sizing whether the goods are white, tinted or dyed. Dark burnt starch is much used for thickening all calico printers' mordants.

Gum arabic is the dried juice of certain species of acacia trees, and is a familiar article of commerce, occurring in all colors from a dark black-brown to a pale cream. All gum arabic does not dissolve alike in water of the same temperature, the cause being due to a difference in the nature of the fragments. Some grades can only be made to dissolve by a special process.

Potato Flour. This is much used in Europe as a thickener, but is gradually gaining in favor in this country. It is sold in several grades, the finest quality being almost pure white. Like wheat starch, it makes a very smooth paste, and when properly stored does not sour readily.

Under the name of Leivgomme is sold a product that is essentially a roasted potato flour, and is virtually a dextrine made from such raw material. It is, when well made, comparatively soluble in water, and makes a very desirable paste for color thickening as well as for finishing purposes.

Sago Flour. This is not, as many suppose, a starch from cereals, but is from the ground or powdered stems of certain varieties of palms found in the Malay peninsula, being cultivated for export on the islands of Ceram, in Borneo, and in Sarawak.

As a cheap thickening agent, sago has few equals. In warp sizing it is superior in point of finish, but its cost is likely to be a trifle greater than that of the usual grade of flour used for such purposes.

Wheat starch is one of the nicest working starches used in textile finishing, and where

possible should always be used instead of flour, which, containing albumen in the form of gluten, is likely to sour more quickly. For finishing the finest and most delicate textures, wheat starch stands without a rival.

Rice starch, prepared from rice flour, is not very well known in this country, mainly from the fact that we have so many other sources of starch and which are cheaper. Rice starch is believed to be preferable to use whenever clay weighting is practiced, but it is believed that for this purpose almost any other starch will answer.

Gum Tragacanth. A transformation of certain parts of the tree that yields this product, being a native of Syria, Asia Minor, and Greece; Smyrna, however, being the chief centre of its trade.

Tragacanth has the peculiar property of not dissolving in water, but of absorbing large quantities and swelling up under the influence of it. It forms a paste that is of inestimable value as a finishing agent for fine textiles, such as velvets, plushes, etc., and also for the selvages of many classes of goods. Tragacanth alone, when dry, is hard and brittle, but it has the property of mixing very nicely with any proper ingredient to mellow the size, such as dextrine, tallow, soap, etc. Tragacanth, owing to its cost, has had many competitors, but it has properties that none of its substitutes possess, and in consequence retains its high position.

WATER, ITS IMPORTANCE IN DYEING AND PRINTING.

BY D. L. MALCOLM.

(Read before the Warp and Weft Club of the Philadelphia Textile School.)

Water is one of the most important factors of the dyehouse. Not only in washing and bleaching but also in the operations of dyeing and printing is successful work more or less dependent upon the quality of the water employed.

Years ago when the woods were the sole coloring matters and before the science of chemistry was thoroughly understood, it was the custom to wash or scour goods directly in the river which of course, on account of the impurities often present, had a very injurious effect both on the dyeing and bleaching, and it became a well known fact that a dyer learning his trade in one town would result in a total failure in another where different water was used.

Every dyer, even those who profess to have but little knowledge of chemistry should at least be able to make such few simple tests as are necessary to determine the character and approximate amount of impurities present in the water he uses.

The lime salts in 1,000 gals. aqua will destroy 1.7 lb. of the best hard soap, for every degree of hardness which is all clear waste, besides, the insoluble curd on account of its greasy nature sticks to the fabric and cannot be removed even by rinsing with hot water. But not only on this account is hard water injurious. Some colors precipitate insoluble impurities with the alkaline earths and may be precipitated altogether. When hardness is due to earthy bicarbonates, such water is not suitable for the solution of many of the coal-tar colors because a portion of the color-base is precipitated as a tarry mass and the dyestuff is wasted.

Iron is also very objectionable in the dyehouse operations. Being usually present as bicarbonate it acts upon soap solutions, causing wholesale waste. In wool scouring, cotton bleaching and other operations, ferric oxide is precipitated upon the fibre and the goods acquire a yellowish tinge which is a poor bottom for the dyeing of bright colors. For washing cloth the importance of soft water is very great. The cloth washed and rinsed in soft water is soft and smooth to the touch and dyes evenly, while that treated in hard water is harsher and the grease remaining from the soap prevents the dye from being properly absorbed.

It is well to remember, however, that hardness of water is in some cases beneficial and even necessary. It causes no harm when acid dyes are used or in mordanting wool, since in these cases acid baths are used; only when mordanting with cream of tartar does the water require to be corrected beforehand, since otherwise a portion of the tartar would be precipitated as calcium tartrate and lost. No harm is caused by hard water in mordant-

ing cotton and silk; in fact it is preferable to soft for fixing the basic ferric sulphate, aluminum or tin mordants on the latter. There are many other cases where the use of hard water is beneficial, as in the dyeing of Alizarines, Logwood, Weld, etc., but no hard and fast rules can be laid down and each case must be left to the judgment of the dyer himself.

The most common impurities to be looked for are carbonates, sulphates, chlorides, nitrates and silicates of calcium magnesium (sodium) (potassium) aluminum and iron. Hard water contains one or more of the salts of calcium, magnesium, iron or aluminum in solution, and is usually defined as one which precipitates soap from solution. It is of two kinds, temporary and permanent. The temporary hardness is usually due to the bicarbonates of lime and magnesium and is so called because prolonged boiling will by driving off part of the combined carbonic acid cause the precipitation of the greater portion of the above impurities, leaving the water proportionally softer. The permanent hardness is due to the neutral sulphates, chlorides and nitrates of lime, iron and aluminum, and is not diminished by boiling at atmospheric pressure.

Saline or alkaline waters are those in which large quantities of soluble sulphates, chlorides and carbonates occur. They are frequently met with in districts where the supply is derived from wells which penetrate the lower beds of coal measures. This alkaline condition is determined by means of red litmus paper. On the other hand we have acid salts and free acid as impurities. Water derived from shale beds containing pyrites and situated near the surface, becomes contaminated with ferrous sulphate. On exposure to air this salt oxidizes, ferric oxide is deposited and the waters contain free sulphuric acid. Blue litmus is used in its detection.

The dangers of using waters containing iron have already been spoken of. They are to be looked for in water which is derived from disused coal pits, iron mines, iron and aluminous shales, etc. All such water should be rigorously avoided, and this impurity can be detected in small quantities by evaporating nearly to dryness, with the addition of a drop or two of nitric acid and hydrochloric acid. If potassium ferrocyanide be now added a blue coloration will be produced and with potassium thiocyanate a red color.

Organic matter in quantity gives to the water a brownish color and in some cases rises to the surface as a brown scum (especially if a little alum be added) when the water is boiled.

The quantitative tests and the correction of waters containing iron and bicarbonates and sulphates of lime and magnesium are given below, but in the absence of iron for most purposes of dyeing all that is necessary is to carefully neutralize the earthy and alkaline carbonates which may be present, with acetic acid—but great care must be taken not to use too much, otherwise bad results will be obtained. The amount of sulphuric acid required for neutralizing 1,000 gals. of water may be readily ascertained in the following manner:

Pour 1 li. water into a white basin and add a few drops of methyl orange. Add from a lurette with constant stirring a solution containing 6 1/4 gms. sulphuric acid in 1 litre of distilled aqua until the color of the liquid changes to red. The number of c.c. thus required corresponds to the number of ounces of sulphuric acid to be added to 1,000 gals. water.

Gardner, Rawson & Laycock give the following quantitative estimation of iron by color tetration with potassium ferrocyanide. A dilute standard solution of iron containing 0.00001 gm. of Fe per c. c. is prepared thus.

0.7 gm. of pure ferrous ammonium sulphate is dissolved in water acidulated with sulphuric acid, oxidized by the careful addition of a drop of dilute potassium permanganate, until the liquid is just pink when it is diluted to a litre. 100 c. c. of this solution is then further diluted to a litre and the solution is then of the strength mentioned above.

10 c. c.-50 c. c. of the 100 c. c. to be tested are placed in a Nessler tube, 1 c. c. of strong hydrochloric acid (free from iron) and 1 c. c. of a solution of potassium ferrocyanide are added, the liquid made up to the 50 c. c. mark with water and well stirred. A quantity of the standard iron solution judged sufficient to produce the same depth of color is run into a

similar tube, the same quantity of acid and potassium ferrocyanide added and the liquid made up to 50 c. c. After allowing five minutes for the color to develop the depth of color in the cylinders is compared carefully and the experiment repeated until a similar depth of color is obtained. Example:—

The precipitate of oxides of iron and aluminum from 1 litre of water was dissolved in acid and diluted to 100 c. c. 10 c. c. of this solution produced the same depth of color with potassium ferrocyanide as 6 c. c. of the standard iron solution. 1 litre of this water therefore contains $0.0001 \times 6 \times 10 = 0.0006$ gm. of Fe.

Calcareous or magnesian impurities are the most frequently occurring and injurious of all and their presence is indicated thus: A solution of ammonium oxalate added to the water in question will throw down a white precipitate of calcium oxalate if lime is present. If, then, on strongly evaporating until turbidity is produced, and adding hydrochloric acid, effervescence ensues, followed by a perfect clearing of the solution, it is an indication that the lime is present as the bicarbonate. No effervescence and no clearing denotes the sulphate, while effervescence and partial clearing indicates the presence of lime as both sulphate and carbonate.

The separation of lime and magnesium is of little consequence to the dyer and will not be treated here. The acidimetric test is a good one for the quantitative analysis of lime present as carbonate and as sulphate. Temporary hardness is estimated directly by titrating a previously noted volume of the water with N/100 acid, methyl orange being used as the indicator. In the estimation of the total hardness sodium carbonate is added and the solution evaporated to dryness. The calcium sulphate is thus changed to carbonate, which is washed and dissolved in a known amount of normal acid. The solution is then titrated with normal alkali and the excess of acid over the amount necessary to exactly neutralize the lime salts present in the water is ascertained. The permanent hardness is found by deducting the temporary hardness from the total.

The correction of temporary and permanent hardness may briefly be defined by three processes; the lime process, the soda process and the combined lime and soda process. When lime is used the free carbonic acid unites with it to form calcium or magnesium carbonate ,which is thrown down from solution. When caustic soda is used sodium carbonate is formed which remains in solution. This process varies in action according to whether sulphates, or both sulphate and carbonates are present as impurities. In the absence of carbonic acid it produces no effect upon water containing calcium sulphate, but magnesium sulphate is precipitated as the hydrate. When carbonic acid is present calcium carbonate is formed as shown by the following reaction:

$CASO_4 + NA_2CO_3 = CACO_3 + NA_2SO_4$. The combined lime or soda process is used for the correction of both temporary and permanent hardness. Mr. Hummel states that if the number of degree's hardness is divided into 130 or 150, the number obtained will approximately represent as a rule the number of litres of water which can be softened by the addition of one litre of lime water. This is very important, as an excess or deficiency of precipitant though added as a cure may prove a cause for greater hardness.

Since many difficulties are to be encountered in the above methods for purification it is necessary that constant care and foresight be displayed in their manipulation, and the operation for which the water is to be used must be taken into consideration, as has already been stated, for most purposes of dyeing impure water (in the absence of iron) may be readily corrected by the addition of the proper amount of acetic acid. But for scouring, bleaching and many other purposes, this method would of course be absurd. The discretion of the dyer must therefore be used throughout the entire analysis, especially remembering the function the water is to play after correction.

The calender was introduced into England from Flanders in the 17th century. During the two hundred years and over that have passed since that time no material alteration or improvement has been made in the principle of the original machine, nor have any great advances been made in the practical application of it.

CORRESPONDENCE AND NOTES

Upon Textile Topics at Home and Abroad.

CURL IN WOOL.

Reading, Mass., July 17, 1903.

Editor Textile World Record:

I have been reading S. B. H.'s article on "Curl in Wool," in your July number, page 84.

Many of his statements are purely theoretical, and cannot be proved. It would take pages to show the errors in the article.

Let me take one point only, under the "cause of curliness." Mark the absurd theory of Burgen, and where he says: "one side (of the fibre) grows faster than another and hence the curly form." This is impossible of scientific verification.

Take Powers' statement that "crimp is caused by frequent . . . and . . . spirally arranged thickenings of the cortex of the fibre." A pure hypothesis. No proof can be shown.

Curliness is due to the same causes, in my mind, as those which make the hair of the negro curly and that of the Caucasian straight. These causes are known to anatomical research.

Crimpiness is wool is probably due to the peculiar form of the follicle, as seen in the skin of the merino sheep. I have a microscopic example of it.

I refer you to the works of W. V. Nathusius, Konigsborn and Bohm, with which you are familiar.

H. G. KITTREDGE.

THE TEXTILE INDUSTRY IN ARKANSAS.

Fordyce, Arkansas, June 30, 1903.

Editor Textile World Record:

Noticing an article in a recent issue of your magazine on cotton growing in the North, I would say that I was raised in Massac County, Illinois. My father operated a gin after the war and we ginned and baled from 150 to 200 bales each year. For several years I have ginned seed cotton that yielded 33 1/3 per cent. of lint. It was grown in Pope, Massac and Johnson Counties, Illinois. We baled some on an old fashioned wood screw press, tied bales with hemp rope and had horse power on the gin and press.

Wool is very cheap throughout this State and Louisiana. Tub washed wool sells at 18 to 22 cents; new wool about 33 1/3 per cent. less. The wool is of medium to coarse grades of Cotswold, Southdown and native mixed; there are no full bloods. There is plenty of burry wool but there seems to be but little suint or oil in the wool. Whether this is due to the hot climate or poor food, I don't know. It is dry and hard to keep tempered or moist in carding and spinning.

It seems to me that a mill would pay well in Little Rock or Memphis, as woolen goods, blankets, etc., sell high, and farmers sell their wool at low prices, principally to junk dealers in Little Rock. I don't know any one here who buys wool, except hide and junk men.

Some of the mills have good machinery, but no good help. A man who manages must be a carder, spinner, dyer, etc., in fact, an all round man. The goods made are principally yarns, blankets, linseys, flannels, etc. They are not finished well. The gigging, shearing, pressing, etc., is bad. They would not pass in wholesale markets for first class goods.

J. W. BOWKER.

In the fourteenth century the British Parliament passed an act that pins should be sold only two days in each year. This was intended to prevent the sale of these luxuries to too great an extent.

SETTING CARDS FOR KNICKERBOCKER YARN.

BY SAM DRIVER.

There are many wool carders, both old and young, in the card rooms today who have never had an opportunity to card for knickerbocker in the mills or card rooms they have had charge of. This article is for the benefit of such carders for there is no knowing how soon they may be called on to card knickerbockers.

The writer has gone to mills where they were making knickerbockers and found drawing waste placed in the worker bearings to raise them from the cylinder, which is a bad and uneven way of setting, placing the workers some high and some low and very irregular on both sides.

A few years ago the writer was a carder for a company running two different mills, and of course employing two carders. The mill the writer was in had to go on knickerbockers. After a few weeks the other mill had to go on the same class of goods. The agent asked the other carder, who had been in a card room all his life and was some fifty years old, if he had ever carded knickerbockers. The carder said yes, he had carded all kinds of fancy yarns. The agent got out a batch for him and after it had been on the cards and a half set of roping made, the agent saw it and ordered the card stopped, saying:

"That will never do. I don't see any knickerbocker about that. I thought you told me you had carded knickerbocker."

"Well," he said, "I have, but they were not this kind and the cards were not the same kind."

"Well," said the agent, "what kinds of cards were they? These are the best cards that are made."

The agent jumped into his team and came down to the mill I was in, and up to the card room he came, all in a sweat.

"Sam," he said, "I want you to go up to the other mill and show that fellow how to set cards for knickerbockers. He told me he had carded them and all kinds of fancies, so I made up a lot and he has made a devil of a mess of it."

So I went up and, lo, and behold, there was no knickerbocker. He had not raised his workers off the cylinders; all he had done was to ease off his fancies a little. Then I went to work and showed the carder how to set cards for knickerbockers, which is as follows:

To begin with both sides of the workers are set to cylinder as nearly alike as possible. There are two five sided set nuts to each worker, bearing studs to adjust the workers up or down to the cylinder. We will commence by raising all the workers on first breaker, except the two last ones next the fancy; seven squares of these nuts on both sides of the card, eight squares if necessary, thus making both sides of the workers set to the cylinder alike. The two last workers can be set according to the size of nubs wanted. Set the second breaker and finisher the same as the first breaker, governing the size of the nub wanted by raising or lowering the two workers next the fancies.

If diverse sizes of nubs are wanted on the same lot, some small and some large, it can be done by setting one side of the two last workers next the fancy on second breaker closer to the cylinder than the other side. It is a mistake to think the fancies should set on the cylinder very light. They should set on hard enough to raise the stock well out of the cylinder, because the quicker the stock can be got out of the card, the better the nubs will be and the stronger the yarn. The strippers can be set close to the workers and cylinder, the doffers set with 26 or 28 gauge.

The above is an easy and correct way to set cards for knickerbockers.

Knowledge is the source of power.

BLOW-OFF PIPES IN STEAM BOILERS.

The blow-off pipe appears to be one of the simplest things about a boiler, and it might naturally be assumed that of all the accessories and fittings it would be the least likely to get out of order. This is not the case, however, and the blow-off needs its full share of attention in design, construction, and general care. We desire to call attention to the subject of reinforcing the opening through which the pipe enters the boiler. A piece of boiler plate somewhat thicker than the boiler

itself should be riveted securely to the shell at this point, and the hole for the entrance of the pipe should be cut in such a way that it can be properly threaded, both in the re-enforcing piece *and in the shell*. The importance of the

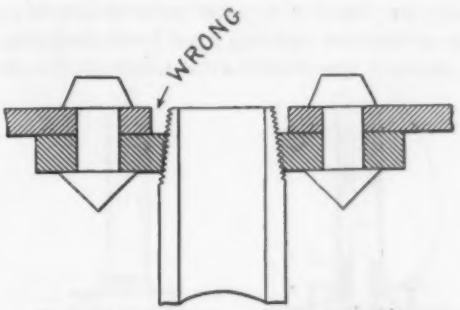


FIG. 1.—WRONG USE OF THE RE-ENFORCING PIECE.

italicized words is often overlooked by boiler constructors, and we frequently find that the opening in the shell is punched large enough to admit the end of the blow-off pipe and leave considerable free space around it, as is indicated in Fig. 1. The re-enforcing plate is then threaded, and the blow-off pipe screwed into that alone. When a job is done in this manner, it is impossible to detect the error from the outside of the boiler, although it is readily discovered by examining the inner end of the blow-off through the handhole in

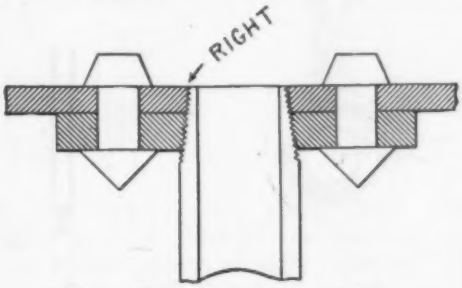


FIG. 2.—CORRECT USE OF RE-ENFORCING PIECE.

the back head, except when the hole in the shell is made small enough to fit the end of the blow-off closely, without engaging its threads.

We have repeatedly seen blow-off pipes put in in the manner indicated in Fig. 1, with not more than three threads holding in the re-enforcing piece. The object of the re-enforcing piece is not particularly to strengthen the small hole that is made in the shell, but to provide a greater thickness of metal for the thread, so that when the pipe is screwed into position it may have a suitable holding power. The correct mode of construction is shown in Fig. 2. In this case the hole is threaded both in the re-enforcing plate and in the shell, and when the blow-off pipe is screwed into position, a good, strong joint is formed, which should be entirely safe under all ordinary conditions of operation.

Many serious accidents have resulted from the adoption of the faulty construction shown in Fig. 1. It is not much more work to make the connection as shown in Fig. 2, and no job that is done as shown in Fig. 1 ought to be accepted.—The Locomotive.

ENGLISH NOTES.

(FROM OUR SPECIAL CORRESPONDENT.)

Complaints of chrome-poisoning are rife again in dye works. The trades unions contemplate an agitation to cause chroming to be scheduled officially as a dangerous trade and hence only to be worked under certain precautionary measures. On the other hand employers are unanimous in protesting that workmen cannot be induced to take advantage of the safeguards already provided.

An informing illustration of labor difficulties in England may be found in the attitude of the operative dyers of Yorkshire towards piecework. Their union is racked with dissension. The Bradford branch, which constitutes a majority in itself, wants no piecework and all other branches want it badly. With the coming of the trusts men have had to work much harder. Their bosses have been paid bonuses for driving, yet the laborers show too little business aptitude to secure those payments for themselves. No doubt the situation looks comic to the American eye.

Spinning-banding made of ramie is coming into favor in large mills here. Ramie is so strong and is so little affected by climatic influences that its merits are thought to outweigh the considerable increase over the cost of cotton bands.

Here is a hint that has been proved valu-

able by at least one firm of high-grade men's-wear manufacturers. It is addressed in particular to those who seek to get a higher level of price than the lowest for goods of cross-bred quality. Smart, tweedy cloths woven solely from worsted, if well-produced and of chaste design, are never quite out of the market. But the weaving of two and two checks and kindred designs is so simple that the prices are the prey of the "cutter." A way to redeem a line is to take extra trouble in getting up the goods, say by taking pains to secure a relatively plain effect.

An infinity of designs suggest themselves as feasible for a summer cloth of 2/42's yarn, both ways. If the surface be sheared long and slightly raised the up finish suffers from mattedness and the general effect is primitive. To avoid the ugliness of a too hairy surface and to lend distinction to the style a second twist should be given. The yarn is then 3/42's and the final thread justifies itself by binding together the unruly fibre of the simple two-fold. Further it permits of the introduction of another tint or color to the scheme and it adds more to the cloth in value than the trouble costs. The hint is for the few rather then the many, but those with an inclination towards superiority will do well to devote some trial-ranges to this new-old device.

To speak of B. A. wool and Bradford tops in the same breath was, a few years ago, nearly as libelous as to mention sand and sugar together. The growing import of River Plate wool and the fact that Bradford prices seem to be fixed forever at less than the cost of combed Australian wool suggests that the veil is dropping from the pretence. With the prices that have prevailed Bradford must long since have been bankrupt had no blending been possible. Yet failures have been few, which leads one to think that the trade if lean is fairly healthy.

Pineapple fibre is generally considered to be longest, strongest and finest in the vegetable kingdom. Some experiments made by the Government in 1892 showed that strands twisted to the size of binding twine, had a breaking strength of 150 pounds.

THE RING FRAME.

BY THEOBALD DEMUT AND ADOLF JUST.

(Handbook of Cotton Spinning.)

The ring frame was evolved from the water frame or throstle by the substitution of a wire or traveler running on a fixed steel ring, in place of the double-armed flier of the fly

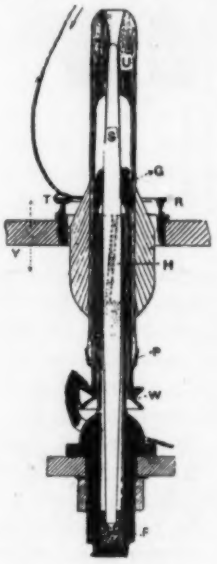


Fig. 1.

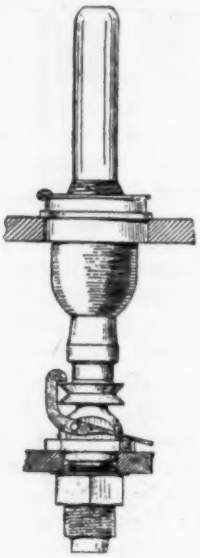


Fig. 2.

Fig. 3.

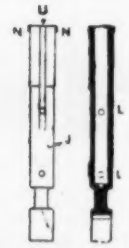


Fig. 4. Fig. 5.

frame. The first patent taken out for ring frames was that of J. Thorp, in America, in 1828; and the first application of the machine was for twisting, and not for spinning.

Figs. 1 and 2 represent a simple type of ring spindle—the Rabbeth. The spindle is mounted in a footstep bearing F and a bolster bearing H of phosphor bronze, and the sleeve connecting the two bearings serves as an oil bath. A shell G is driven tightly on the tap-

ered spindle S and carries on its lower extremity the driving pulley or whorl W, and over the spindle and shell is slipped the wooden bobbin U, a small cup-shaped socket B receiving the lower end of the bobbin in order to enable it to run perfectly true and prevent it from splitting. A small collar below the socket, large enough to hold a few turns of yarn, serves for fastening the end of

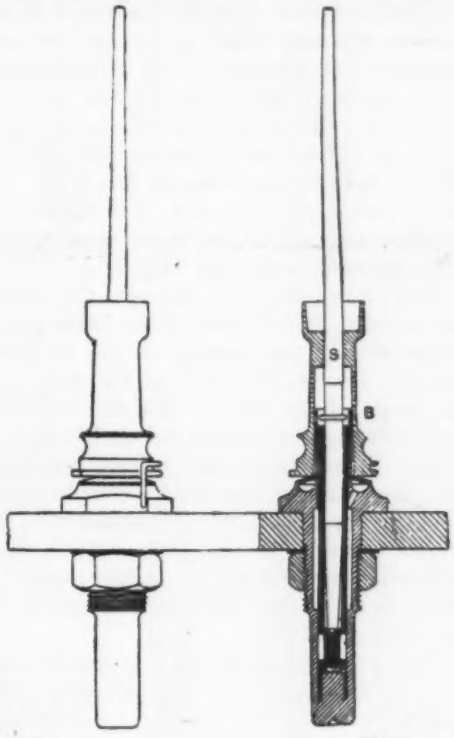


Fig. 6.

Fig. 7

the yarn on the spindle when doffed. The spindle projects through the ring R, the lower conical portion of which is fixed in the ring rail Y, with which it slowly travels up and down. The upper flanged portion of the ring acts as a guide for the traveler.

When the spindle is set running, the thread passing from the drawing rollers, through the traveler and on to the bobbin, tends to twist on itself. Tension is thus set up in the thread, and as a slanting pull is exerted on the traveler (Fig. 3), the latter is drawn round the track formed by the ring R. In proportion, however, as the yarn is delivered by the drawing rollers, the traveler lags behind the bobbin, and thus causes the thread to wind on the latter. The thread is wound in cop form, inasmuch as the ring rail rises and falls only by a distance corresponding to the tapered apex of the cop—i. e., has a similar motion to that of the faller wire in the self-acting mule.

When the tapered point of the cop A (Fig. 3) is being wound, the pull necessary to draw the traveler round the ring is greater than while the lower and thicker part B of the cop is building, the pull in the latter case being more tangential. This unequal pull is a defect inherent in the ring frame, and entails the use of thick wooden bobbins. This defect is associated with another—viz., that while the nose of the cop is being formed, and the thread pull is therefore greatest, the traveler runs at a relatively lower speed, and less twist is imparted to the thread. Consequently, in spinning weft yarn, which is always slack-twisted, the fluctuation (1 to 2 per cent.) in the twist, coupled with the stronger pull, constitutes a frequent cause of breakage in the yarn.

For instance, when a 16's yarn is being spun with 16 3/4 turns per inch, the nose of the cop (thickness of bobbin) being 3/4 in. and the base 1 1/2 in. in diameter, one coil at the tip corresponds to 2.356 in. of yarn, whilst at the bottom 4.71 in. go to the coil. Now the theoretical twist in 2.365 in. of yarn is $16\ 3/4 \times 2.356 = 39.4$ turns; and in 4.71 in., $16\ 3/4 \times 4.71 = 78.8$ turns. However, as one turn in the twist is always lost on each coil, the yarn at the cop nose only receives 38.4 turns of twist in 2.356 in., or 2.54 per cent. less, whilst that at the base receives 77.8 turns of twist in 4.71 in., or 1.27 per cent. less; hence the difference in the twist is 1.27 per cent. This inequality is afterwards compensated for during the unwinding of the yarn, for the nose of the cop then receives a supplementary twist in each coil. The rise and fall of the ring rail also produce an irregularity in the twist, inasmuch as when the ring is ascending, a greater length of yarn is wound than is delivered by the drawing rollers, a part of the ballooning free thread between these latter and the ring rail being

taken up. Conversely, during the fall of the ring rail less thread is wound than is delivered by the drawing rollers owing to the increasing distance between the thread guide and traveler.

If, for example, the lift is 1 3/4 in. and the length of yarn delivered by the drawing roller

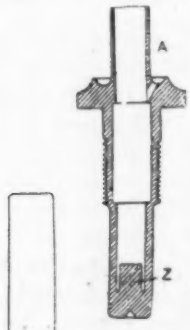


Fig. 8.

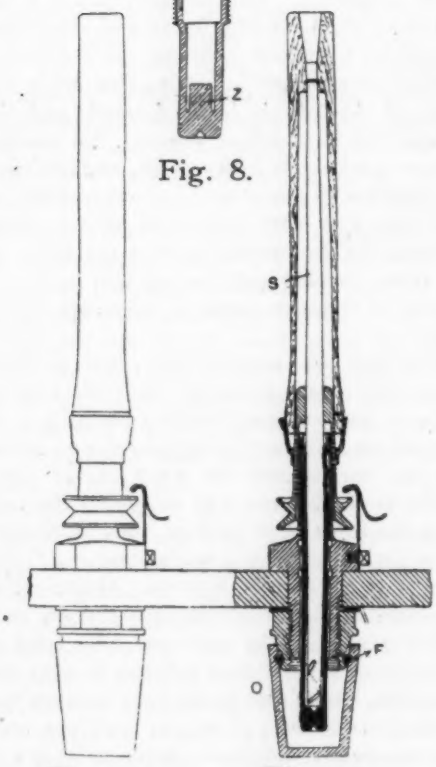


Fig. 9. Fig. 10.

is 90 in. during the descent and 30 in. during the rise, then during the downward course only 88 1/4 in. of yarn will be wound, but 31 3/4 in. during the ascent (in one-third the time). The difference in proportion is therefore 1 3/4 in. in 90 in., or 1.94 per cent. less in the former case, and 1 3/4 in. in 30 in., or 5.83 per cent. more in the latter than is momentarily supplied by the drawing rollers; hence the total difference is 7.77 per cent. This implies a corresponding difference in the twist—i. e., during the ascent of the ring rail the yarn receives 7.77 per cent. less twist than during the reverse movement. This inequality cannot be obviated, and hence the yarn twist is always irregular in these frames, the difference, moreover, being greater in low numbers than in fine yarns.

Great variation exists in the shape of the traveler, formerly made of bronze, but now invariably of hardened steel. In England there are two types, the Scotch and the American. The former, introduced by Eadie Bros., of Paisley, are narrower and made of thicker steel, so that they are firmer and less easily pulled off the rings. Of course, the travelers selected for any frame must be perfectly uniform in size and weight.

The higher the yarn number, the lighter the traveler; and the size of the latter is also influenced by the diameter of the ring, the spindle velocity, the twist in the yarn, and the staple of the cotton. To find the most suitable gauge of traveler for each yarn is a matter demanding the utmost care and attention in order that the most favorable conditions of production may be obtained. The travelers soon wear out and must be replaced at frequent intervals. The annual outlay on this account may be put down at about 8s. 6d. per 1,000 spindles.

Figs. 4 to 8 represent the ring spindle made by J. J. Rieter and Co., of Winterthur. The spindle S rests in the bearing J, which slips into the oil bath A, and rests on the projection Z by means of a cork washer K. These spindles run lightly and noiselessly at a speed of 10,000 revolutions a minute. The weight of the tubes for export yarns amounts to about 4 to 4 1/2 per cent. of the copped warp. Figs. 9 to 15 illustrate the ring spindle made by Dobson and Barlow. The rubber collar K ensures elastic support to the inner bearing J, which is kept from twisting by the stud N, and held down by the screw ring S. A large store of oil is retained by the oil bath O, which is detachable, but held in place by an elastic wire ring F. The oil enters the bearing J through the oil hole L, and being carried upwards by a spiral groove cut in the

spindle S, overflows at the top of the bearing J, whence it runs back down the groove U into the oil bath O. The oil consumption in ring spindles is only about 4/5 gal. per 1,000 spindles per annum, and is therefore very low.

Fig. 16 represents the Whitin gravity spindle with Woodmancy's oil bath O and spindle hook H. A noteworthy feature in this type is that the bearing Y in which the spindle is mounted is very heavy, and terminates below in a solid block to take up vibration. The large size of the oil bath O enables it to be emptied and refilled while the spindle is running, oil being poured in until the level reaches to within 1/2 in. of the top. Platt Brothers have improved the gravity spindle by providing a sloping oil bath, so that the dirty oil can be pumped out immediately under the footstep bearing without removing the spindle.

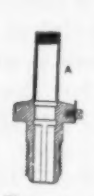


Fig. 11

Fig. 12

Fig. 13.

Fig. 14

Fig. 15.

Fig. 20.

Fig. 21.

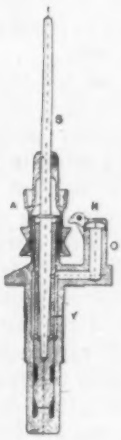


Fig. 16

Fig. 17.

Fig. 18

Fig. 19.

Howard and Bullough's spindle is shown in Figs. 17 to 19. The vibrations of the spindle are here taken up by a lateral steel spring F on the bolster bearing. The oil cup O is screwed in from below by means of a quick multiple thread and slightly taper screw. The cup can be quickly detached for cleaning and refilling while the spindle is running. When the frame is first started, the oil should be renewed at the end of two or three weeks, but afterwards the spindles will run for several months without cleaning or oiling; but all spindles should be examined by the oiler once a week.

To obviate the evils of unequal thread tension, and at the same time enable the yarn to be wound on the bare spindle, as in the mule frame, a special type of traveler is used. The ring spindle of W. Lancaster is shown in Figs. 20 and 21. As usual, the traveler consists of a loop O guided by a fixed ring, but is supplemented by a forked attachment G, which is also guided on the ring. If, as is shown in the drawings, the yarn be passed through the traveler and the fork G on its way to the cop, the bar connecting the traveler and fork rests against the cop and is carried round therewith, thus reducing the yarn tension and rendering it independent of the cop diameter. On the other hand, the delicate traveler requires careful looking after, and costs a good deal more to keep in order.

FINISHING WOOL AND MIXED FABRICS.

XXV.

BY N. REISER.

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PATTERNS MADE BY SINGEING.

Stencil plates are used to expose certain portions of the cloth to the action of the flame. The operation is the same as that already described for producing patterns by napping cloth covered with a stencil plate except that a flame is substituted for the napper roll.

PATTERNS MADE BY PRESSING.

The goods are slightly sized on the back side, dried and then passed through two rolls of which one has a design cut into its surface. The raised parts of this roll, which is heated,

squeeze the cloth hard against the surface of the other roll, forcing the size into the fabric and causing the nap at these places to adhere firmly to the cloth. The nap at the other parts opposite the low places remains unaffected by the process. The pattern results from the contrast between these two parts of the goods.

The size may be omitted and the slightly damp goods pressed very hard at a high temperature between a plain and an engraved roll.

PATTERNS BY CRUMPLING AND PRESSING.

Irregular effects are developed on pile fabrics, such as velvet and plush, by crumpling the goods and then subjecting them to pressure, heat and moisture. One method used for this process is as follows:—

The cloth is laid on a table and then crumpled by hand into as small folds and wrinkles as possible. It is then stuffed into a sack, sixteen inches or less in diameter. To facilitate this work the sack is first rolled inside out, and the goods packed closely until the entire piece is inside. The filled sack is then bound tightly with cord which is first wound diagonally from end to end and then crossways, is subjecting the cloth to a high pressure.

In this condition the goods are boiled in water for seven or eight hours, or still better, subjected to a steam pressure of 25 or 30 pounds for about three hours. When cold, the plush is taken from the sack, wet out, tentered and dried.

PATTERNS FORMED BY COATING WITH POWDER.

This process is employed only for velvet or velvet-like fabrics made of carded yarn. There are two distinct methods. By one the dust or powder is scattered irregularly over the surface of the cloth; by the other it is applied only in certain places to form patterns by using a stencil plate.

By the first method the whole surface of the goods is coated with a varnish; by the second, only those portions are coated to which it is desirable the dust should adhere.

The varnish is made by boiling linseed oil and slacked lime or caustic soda together.

After the goods have been printed with the varnish they are passed through the dusting machine. Here the cloth is stretched tightly both width and lengthways and passed under a vibrating sieve filled with the fibre dust which falls in a fine shower on the coated surface of the cloth. A stream of the powder is kept running into the sieve so that the same level is maintained during the operation.

The cloth is then run through a whipping machine where it is beaten on the back. This distributes the powder uniformly over the coated surface and removes it from the uncoated part of the goods. It is then dried at a temperature of 150° F. and rolled up.

PATTERNS PRODUCED BY CHEMICAL MEANS.

The chemical processes for decorating cloth consist of carbonizing, singeing, mordanting, dyeing and printing.

Carbonizing. The pattern is developed in the same way in which the cotton heading or selvage of woolen goods is protected by the application of alkali before the goods are baked. The alkali neutralizes the acid and prevents the cotton so heated from becoming carbonized by the heat.

A German process for producing patterns in this way consists of soaking the goods in acid as for the regular carbonizing process. The cloth must be a mixture of wool and cotton. The pattern is then printed on the goods, a mixture consisting of a strong alkali and dextrine (the latter serving as a thickener) being applied to those portions where it is desired the cotton should remain. The cloth is then dried at the regular carbonizing temperature, which carbonizes only the cotton that has not been treated with the alkali mixture, leaving the other unaffected.

By piece dyeing the wool the pattern is developed with a combination of a mixture and a solid color. The wool and cotton can also be colored in the raw stock, producing many different effects in the finished goods.

The process may be modified by printing the cloth with an acid mixture. The subsequent carbonizing affects only those parts impregnated with the mixture.

Care should be taken not to use too large a proportion of the vegetable material in making the goods, otherwise the carbonized portion will be thin and tender.

Singeing. We have already described the process of singeing the goods under stencil plates. Another method consists of impreg-

nating those parts of the cloth that are not to be singed, with a thickener carrying a substance that will protect the fibres from the flame. The best material for this purpose is ammonium sulphate.

The various processes employed for decorating cloth by mordanting, dyeing and printing are outside the scope of a work on finishing.

SILK THROWING.

BY FILATURE.

OPENING SILK.

The raw silk as received by the throwster is in skeins tightly twisted up on a roll. Each skein contains 4 to 6 matted parts called gums. The object of untwisting these rolls, or opening same and tying up into loose bunches is to permit the soaking solution to act uniformly on all parts of the skein, especially on the matted parts. A better method, however, than that of tying into bunches, is to untwist the skeins and place in bags or nets having a mesh of 1/4 to 1/2 inch and holding about 10 lbs. each, and to leave in these bags until the dander is ready to place on swifts.

The advantages of this method are: First, a minimum number of torn ends, no silk tied up into knots and ends entangled in tie strings. Second, the privilege of soaking several lots in the same tub when the nature of the silk permits. Third, the convenience of keeping tally of each winder, as to the quantity of silk wound.

SOAKING.

The object of soaking is: First, to soften the matted parts that they may be rubbed or combed out. Second, to render the thread pliable. Third, to lubricate the thread. Fourth, to add weight which, however, is not approved by the writer.

First, silk wound with the matted parts in the skein means a great loss of the silk thread, due to increased ruptures of the thread; also less production and consequently increased cost.

Second, pliability renders the thread stronger as the gum becomes tough and elastic; makes the silk work better on the machine and lessens the tendency to break; the silk takes up the twist better. By actual test it is found that a harsh, dry silk requires a twist wheel two turns higher than silk in a pliable state. The tendency to snarl up and cause kinks and fly off into other threads, as is the case very frequently in doubling, is reduced.

Third, the necessity of lubrication will be recognized by following the course of a thread of raw silk as it is made into organzine. We see it pass over guide eyes, tension or drag wires and cushions, drop fallers and flyers, in five different departments, in several departments over two and three sets, so that the friction on the thread is very great, so great, in fact, that the hard music wire flyers are cut in four to six weeks' time, and the porcelain guides in the course of six to eight years of service. When the thread is properly lubricated, it is more uniform and not so subject to atmospheric changes, is less liable to chafe, as is the case with a harsh, dry thread when the gum is boiled out and silk dyed.

Fourth, "Where ignorance is bliss, 'tis folly to be wise," well illustrates the practice of many manufacturers who give out their work and demand a specified clearance. It is folly to demand heavy returns because he (the manufacturer), will be obliged to pay his dyer for so much soap and oil as the throwster added to make the desired return. Further, the thread is often stripped of its necessary siricin, so vital to its working qualities, in an attempt to add weight if the work is not done intelligently.

To demand light returns, especially on heavy gummed silks, will only be tempting the throwster to forbidden ground. There are many conditions to be considered in clearing a lot, and only he who is in immediate touch with the same can know what return to expect, i. e., the nature of the gum and the percentage of the same contained in the raw, the quantity of oil and soap added in the soaking bath, the temperature of the same, the humidity of the mill room and the amount of waste made.

As advice to those who have raw silk to give out to be thrown would say: First, select a competent throwster with a character

and reputation. Second, impress upon him that you want your silk properly treated, regardless of returns. Third, if they return heavy and you want to save the dyers' charges, then let him weigh up the bundles light, or in other words, deduct a few ounces per bundle for moisture, soap and oil. Fourth, if you are suspicious of your returns, send your silk to the conditioning house and have a boil-off test made, and you will then know where you are at. Fifth, five and ten cents per pound saved in the price of throwing is often saving at the "spigot," the waste being at the "bunghole." Intelligent and skilled management demands reasonable compensation the world over, and is well worth the same to both manufacturers and throwster.

The methods of soaking are legion. Each throwster has his own method, some "wise," but mostly "otherwise." In many instances, the methods pass current from one foreman to the other, who have no further knowledge of treating silk than that gained from some friend or predecessor, which as a rule is sure to make trouble.

They have one solution for Japan, regardless of the fact that the gums vary with the provinces where the cocoons are raised, and the method of reeling. No fixed solution can be given; what may be just the bath for one lot, may spoil the other. The essential part is to know the physical properties of the raw you are treating and its requirements. If a strange lot, try a sample according to the best of your knowledge and ability until you find just what the silk needs. Better spoil a five-pound sample than a whole bale.

WINDING.

Where skilled help is to be had, it is advantageous to have each winder dander her own slips, but in locations where there are many learners there should be special girls to dander the skeins, who have sufficient intelligence and skill to rub out the gums and put the skeins on the swifts in a proper manner.

In rubbing the gums, care must be exercised so that the silk is not rubbed too hard and cause soft parts in the skein. In many mills, the gums are combed out with a comb having a music wire tooth, which is by far the quickest way and gives the best results.

Don't run at too high a speed, especially on fine sizes. Remember that silk, after leaving the soap tub, is 10 to 25 per cent. more elastic, and that you are liable to destroy the elasticity and make the yarn brittle in the loom.

The defects in the winding room are: Hard bobbins, long knots, looped ends, waste in bobbins. Hard bobbins are the result of improperly soaked silk, and winding the same too wet. The same is attributed to the fact that the surplus gum covering the thread has been softened into a paste instead of removed or covered with oil to prevent the pasting together when drying on the bobbins. When troubled in this line, comb out the silk, and allow same to become dry before winding. In the next bath add more oil, and when whizzing out same, pour several buckets of warm, soft water into the extractor. Make sure that the silk is thoroughly whizzed out before winding.

Long knots catch in the eye of the second time flyers and cause split ends. Ends tied upon the bobbin with a thread looped over it, will pay off with considerable tension and cause loopy work of the worst character in tram doubling.

FIRST TIME SPINNING.

The defects in first time spinning are: Slack twist, kinks or snarls, chafed or flossy silk and soft take-up bobbins.

Slack twist may be caused by slack bands, gummy spindles and spindles improperly set. Bobbins with slack twist should never pass to the doublers. If passed through, will show up as a soft end after being boiled off for dyeing, and the result will be a weak or flossy end. Slack twist may be known at the doublers by the soft wound bobbins.

Soft bobbins will also double up loosely and cause corkscrew in the finished work. Chafed or flossy bobbins are the result of allowing the take-up bobbin to run idle for hours, as in the case of running spindles after working hours and neglecting to set up the same; also by giving large parts to hands on bad running silk.

Kinks or snarls are caused by the stopping of the frame when the take-up roll ceases to revolve before the spindle. The kinks are ag-

gravated by a dry, hot atmosphere. They should be stretched, rubbed or tied out before starting the frame.

ORGAN DOUBLING.

The following systems are most generally used: Flyers, Plush cushion, Jack board. Flyers which are still used at many mills are out of date. It is the most troublesome and expensive system. The wires may be cut. The blocks wear out elliptical and wobble. The arms are constantly out of shape, causing either a loose or tight tension. Waste, dirt and grit collect under the flyer, and requires oiling daily. Only by constant care and vigilance can an evenly double thread be secured.

Plush cushion: The tension is secured by a cushion of mohair plush 6 to 8 inches wide, over which the thread passes. The thread is taken off the first time bobbin with a cap such as is used in reeling. The life of a cushion is from 3 to 4 years, if arranged to shift to unworn places. This system causes the most even tension and the frame can be run at a high rate of speed.

Jack board: This consists of having loose pin first time take-up bobbin with fibre heads, and running on doublers same as tram doubling. This system is the most economical as far as production per operative is concerned, as a bobbin always runs better off its side than over its head. It is, however, being replaced by the plush cushion because of the constant care and attention required to give an even tension.

The defects in doubling are: Single threads, corkscrew threads, loopy threads.

Single ends are caused by one of the ends breaking, and the stop motion refusing to work. It is known by its soft and flossy appearance in the dyed state, and its lack of twist, the latter due to the fact that the second time twist is opposite to the first time, and the twist therefore taken out if run through second time. In the raw state it does not show, as the gum holds the cocoon fibres together.

Corkscrew is the result of uneven tension; the neglect in bringing the ends together on the doubled bobbin, either in doubling or second time, before tying up. It is also caused by uneven silk and by silk doubled together with an unlike percentage of moisture, causing uneven contraction when drying. A corkscrew generally is the cause of split ends in the loom, as the short thread usually breaks under tension, shoves up to a ball of waste and catches in the reeds and harness.

A loopy thread is found mostly in tram. This is caused by an uneven tension similar to that of organ. Not until the throwster furnishes the manufacturer with a perfect thread can he make a class of goods equal to that of the French manufacture.

THE "PAQUET" REED.

The success attending the introduction of the ondule reed, even if only temporary, caused attention to be given to the reed as a means of obtaining fancy effects. The latest phase of this movement has resulted in the production of

Fig. 1.

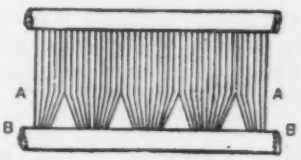


Fig. 2.

the paquet reed, which has been invented by Mr. Augustin Abad of Sabadell, near Barcelona, and been taken up by the manufacturers in the Cataluna district in Spain. The arrangement of the reed is such that spaces free from warp threads can be left in the cloth

in predetermined places, and these can be made to appear more prominent or open by the use of fine or loosely-picked weft.

Fig. 1 represents a simple type of fabric which has been woven by the paquet reed, where it will be seen that in certain places the warp threads begin to diverge from each other in groups (A) until a series of open places are formed (B), when the cloth again commences to return to a normal condition. This reed can be worked in combination with a doup in front of the reed, and it will be seen that quite a wide field of ornamentation is open in this direction. The paquet effect is obtained by the arrangement of the reed dents, one system being shown in Fig. 2, this being the reed used for producing the design shown in Fig. 1. The dents are firmly soldered to the base of the reed frame after being drawn into the position shown in Fig. 2, and must be strong enough to meet the strain put upon them by the displacement of the warp. The reed is raised and lowered by mechanism similar to that employed when weaving ondule effects, the two classes of design being identical as regards their manipulation.—El Eco de la Industria.

ZIBELINE WAVE EFFECTS.

In the April issue of the Textile World Record appeared an article on the new zibeline fabric called "crispe" and "ondule," which have been very popular during the past season. Our Paris correspondent referred to the same fabric in his letter in the May issue. Samples of these cloths are at this office where they may be seen by anyone interested. We are now able to give our readers the following description of the construction and finish of the goods as given by a correspondent in the Oesterreich Wollen und Leinen-Industrie:

The filling is made of mohair, cashmere, camel's hair or shoddy. The warp of the cheaper qualities is cotton yarn and of the better grades coarse woolen yarn. The weave is usually a four to eight leaf satin, the filling floating on the face. If a back filling is used the stitches must be well distributed so as not to interfere with the smoothness of the face. The weight of the back filling must be considerably less than that of the face. If the filling is woven 1 face, 1 back, instead of 2 face, 1 back, the larger quantity of backing in the goods will injuriously affect the appearance of the face. The wave effect of the face is obtained by the finish.

As will readily be seen the weaving process is very simple, the most important points being the selection of the material and giving the proper twist to the yarn. Upon these depend in great measure the success of the finishing process in producing the wave effect. As the yarn used for these goods is for the most part purchased in England and Germany, the motto in manufacturing these goods should be, "Experiment goes before practice." In order to be sure that the yarn is adapted for the finish, it is advisable to weave and finish short samples before making large lots of the goods.

The mixing of the different materials is of the utmost importance as a slight deviation from the right quality of the cashmere or mohair will give the finished goods an entirely different appearance. The wave undulations will be either larger or smaller, and the lustre and general appearance of the goods will be correspondingly changed. It is not in the power of the finisher alone to give this wavy effect on the cloth. He can by skilful handling develop it to a greater extent and increase the natural lustre of the material, but the foundation for the final result must be laid in the selection of just the right raw material for the yarn.

Coming now to the finishing process, the goods are carefully burled, fulled and washed. As the material on the face of the goods felts readily and the twist and weave contribute to the formation of the wrinkles and streaks, every precaution must be taken to avoid these evils. To this end, the pieces are scoured in the open width and tacked before fulling; that is, the listings are sewed together so that the piece forms a sack. This sack is kept extended during the fulling process by the air inside it, thus preventing fulling-mill streaks. Otherwise the handling of the goods is exactly the same as for other fulled fabrics.

Next comes the gigging, which should be done only with teasels; the treatment can be somewhat more severe than with face goods.

If the proper raw material has been used the wavy effect will develop soon after the gigging has begun. The gigging must be continued until this effect is fully developed. The goods during the gigging should be very wet and during the last runs should be in running water. After gigging, the wet pieces are wound on perforated rollers and left for ten to twelve hours in hot water, 155 to 167 degrees F., or moderately steam blown. After this the goods are dyed, then gigged wet. Frequently the lustre is increased by coating the face of the goods with a dressing composed of British gum, flour and glycerine, mixed with sufficient water to make the mixture a thick paste. This preparation is applied to the face of the goods which are then dried and steamed in an iron boiler for one-half hour at about eight pounds pressure. The goods are then rinsed in a washer to remove all trace of the dressing and again gigged wet. The dressing imparts a much greater lustre to the goods, but is adapted only for dark colors as it changes the lighter shades materially. This process is used only for the finest and most expensive cloths. As it is expensive and requires a great deal of time it is impracticable for the low grades of goods. The cheaper grades after dycing are well rinsed and then gigged while very wet with moderately sharp teasels. This process is completed by laying the nap until the required wavy effect is obtained. It is necessary that the goods should be either run through a tank of water or that the water should be freely sprinkled on them during the gigging process.

Next comes the "breaking" of the nap. This is done by passing the cloth over the sharp edge of an iron plate while winding it on a roll. The sharp angle at which the goods are bent by the plate breaks the nap and increases the wavy effect. This operation is repeated two or three times to increase this effect. The goods, dripping wet, are now taken to the dryer. In contrast to the usual method adopted for drying other cloths, these fabrics are dried at as high a temperature as possible in order to evaporate quickly the large quantity of water remaining in the goods. Drying machines in which the air circulates around the cloth instead of being blown through it are better for finishing this class of goods, because the air passing through the goods is apt to upset and disarrange the nap. When shearing all the shear brushes are run with the nap. The cloth passes over the rest at a sharp angle so that only the long hairs are cut from the face. The cloth is run on the shear until all the straggling fibres are removed and until the brushes have developed the wavy effect as much as possible. Usually goods are finished as they come from the shear, but in exceptional cases they are run over a steaming brush.

DECORTICATING RAMIE.

A new method of decorticating ramie, which is said to efficiently disintegrate and dissolve the gum without injury to the fibre, has recently been patented in Algeria. The alkaline nature of the salts contained in more or less concentrated sea-water, or a liquor composed of the constituents of sea-water, exercises a beneficial action in the preservation of the silky properties of the fibres, so the substance to be treated, such as ramie or aloes-wood, is immersed in a solution containing the following salts in approximately the following proportions: Sodium chloride, 25 grms.; potassium chloride, 0.7 grm.; magnesium chloride, 3 to 6 grms.; magnesium sulphate, 6 to 7 grms. Traces of alkali-iodides and bromides may be added also. The above-given constituents and proportions correspond to those of the salts contained in one litre of normal sea-water, but their relative ratio should be taken into consideration in preference to their absolute value. Thus, if concentrated sea-water were used, the same proportions would correspond to less than one litre; but as they would still bear the same ratio to one another, the solution would still constitute a liquor suitable for securing the desired result. Ordinary sea-water, therefore, can be used, or sea-water which has undergone a certain degree of concentration by evaporation, or a liquor prepared artificially, and containing the aforesaid quantities of salts to each litre, or less, of water or thereabouts.

In about four or five days, and at a tem-

perature of 86 deg. F., fermentation takes place within the mass, and, after fermentation for about eight or ten days, the gums are completely removed and the operation is completed. The fibres, which are now entirely freed of the incrusting matters which have been dissolved by the saline solution, are next removed from the liquor. By the action of the saline solution the foreign matters of the fibres are both disintegrated and dissolved, whilst, owing to the alkaline nature of the solution, the qualities of the fibres are preserved.

The patentee does not confine himself to these proportions of salts, nor to the concentration of the liquid, provided that the salts are mainly as contained in sea-water. Either ordinary sea-water of different degrees of concentration, or water containing the salts in the same, or approximately the same, proportions as those in which they exist in sea-water, can be used.—Textile Manufacturer.

TEXTILE FIBRES OF THE PHILIPPINES.

BY A LOOKER-ON.

Although the most valuable fibre of the Philippines at the present time is hemp, or abaca, there are a number of other kinds of textile fibres of considerable value. The natives have been accustomed to cultivate various descriptions of fibre-plants for years. Then there are the natural growths of fibrous substances of the field, the forest and jungle, all of which are being examined and their value determined.

The products of animal growth are limited to the wool of sheep, goat hair, and the hair of a few other animals. Sheep are, of course, few in number. Then as to cotton; the Spanish used to get quite goodly quantities from both the cotton plant and the cotton tree and some of the fibre was exported. In recent years the cotton plant and cotton tree have been neglected, because the fibre does not come up to the standard of fineness, elasticity and color of the American crop.

What interested me more than anything else in the fibre line was the peculiar samples presented by these natives. In Fig. 1 we exhibit one of the fabrics made of some layers of hemp fibre, arranged parallel as shown, while the bunch is twisted up with cordage as shown. This outer cordage is made of hair, of perhaps the fine pine-apple fibre, and when colored, presents a unique appearance. This style of yarn is slowly and tediously made, but when compactly laid and combined, can

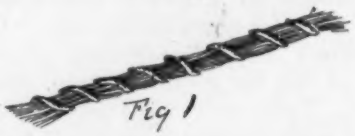


Fig 1

Fig 2

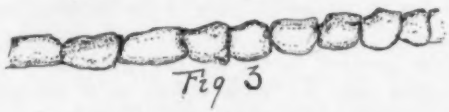


Fig 3

Fig 4

Fig 5

Fig 6

be woven into fancy designs. I have seen some of this kind of fibre used freely in colors in white grounds of cotton, silk, and other texture. The hemp fibre itself is shown in figure 2, in its crude form. The strands are usually quite compact and in parallel order as represented. These may be readily

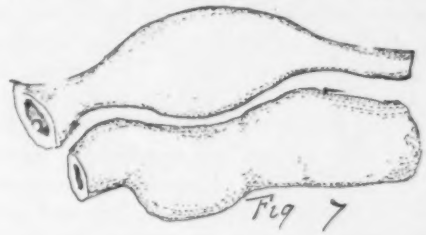
combed out in sections and lengths and worked as fibrous stock.

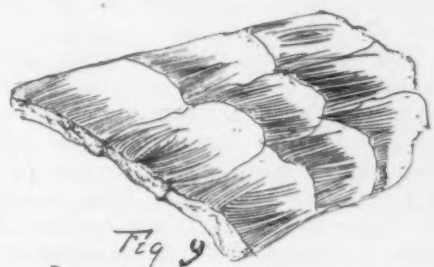
At Fig. 3 is a magnified sample of fibrous material obtained in the vicinity of taboacco plantations as a rule. In fact, this fibre is known as the tobacco fibre. It consists of a series of soft brownish bunches, very silk-like in structure, connected by a natural common strand. The strand sustains the particles in line as shown. The fibre is coarser than common wool, but takes the most brilliant of shades. It is strong and well suited for weaving.

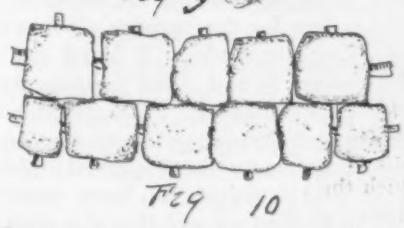
At Fig. 4 is an enlarged view of a wool fibre. The sheep of this country in years from now may be productive and profitable, but at the present time the system of care and maintenance of the sheep is so poor that the prospects are not encouraging. One sees slender wild sheep jumping about in a frightened condition on the plains, in the jungle and on the hill-sides. The only wool procured is that which is cut from the hide after the animal is killed for eating purposes. The coarseness of the wool is partly made up for by its strength and the affinity for coloring matter.

Fig. 5 is a cross sectional view of a wool fibre, showing the plan of the cell arrangement, which is not very unlike the cell plan of the wools of American bred animals. The natives depend some on the hair of goats, cats, dogs, deer, and various other animals for making cloths. In Fig. 6 is shown a sample of a fibre of animal hair. This is presented to indicate the smoothness and general lack of serrations that exist in all the animal hairs of the tropics. The result is a sort of stiffness in the fibre which is felt throughout the finished yarns or fabrics. There is not very much system employed in preparing the material for use; the native dealers consist as a rule of some venders who occasionally go to the hills and secure the fibre, then bring it to the markets for sale in little lots. The Chinese buy these small lots, pack them together in bales, and ship to China or other countries, obtaining many times the original cost.

I investigated the cultivation of cotton in this country and discovered that the bulk of the fibre was irregular. The structure of the fibre under the glass presents an appearance not unlike that exhibited in Fig. 7. Occasionally fibres as shown at Fig. 8 are found. Here we have the white cotton strands, hollowed just like the cylindrical formation of the American fibre of cotton, and arranged as shown. From a general observation one would almost suppose that the Philippine cot-







ton fibre was devoid of uniformity, due to swellings of the tube, but this irregularity is natural and remains within narrow limits. When woven into cloth the unevenness partly disappears. The native cotton dyes are very fugitive, and most all samples shown me were faded.

Attempts to raise silk in the islands have been in progress for generations. The first settlers introduced the silk worm. There is

an abundance of mulberry trees growing in many portions of the islands and the silk raisers have utilized these trees to advantage.

Silk raising has failed because of lack of steadiness and enterprise on the part of the natives. The native character is such that regular labor is impossible. The natives are likely to suddenly cease caring for the worms some day, and before they feel like working again, the worms are dead. The climate favors the silk business, and no doubt in time silk raising will be one of the industries of the islands. The natives are wonderfully ingenious in the forming of mechanical contrivances for textile operations. One sees garments made of pearls by uniting the shells, edge to edge, with little links, as in Fig. 9. Sometimes pearls, or bits of leather, or perhaps portions of the horn of the caribou, are united into a surface-like order, as exhibited in Fig. 10, by stringing the parts with cords. There are holes laboriously bored through each part and the cords or cat-gut strands are passed through as shown and the connection effected.

I will invite your readers to come with me to the hemp and other textile works of the island of Mindanao, where the Moro textile workers produce yarns, ropes and fabrics that differ more or less from the same grades of goods manufactured in other islands of the Philippine group. Upon reaching Mindanao I proceeded to visit the important industrial points for the purpose of determining the progress made. I found that the textile workers in and about the commercial centres of Zamboanago, Jolo, Cottobatto, Malabang and other towns were doing quite a good trade under the improved order of things. First I visited the hemp works in each of these sections and then the places in which the finer fabrics are made. The hemp plantation should be gone over first, before looking into the weaving works. I found large numbers of natives employed on some of the hemp plantations. These plantations include extensive growths of the banana product, a part of which is suitable for extracting the hemp strands. The native labor on these plantations is hired at from ten to twelve cents per day; or where the datto system is in vogue, the slaves of the datto do the work, receiving their board and lodging. The sultans of the race are over the dattos, and ranking next to the dattos, and below them are the rajahs. These sultans, dattos and rajahs own extensive hemp and other fibre plantations and these plantations offer a promising field for Americans. The labor on the plantations is accomplished on very crude

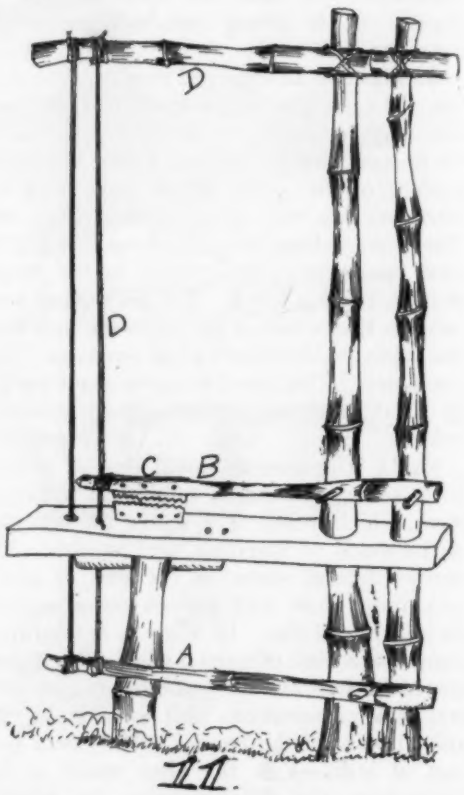


Fig. 11.

lines. The tools are mostly pieces of wood for stirring the earth.

The operation of extracting the fibre from the specially assorted portions of the banana growth is interesting. First you see natives arrive at the works from the plantation laden with strips which have been cut from the banana growth. These strips are manipulated in the device shown in Fig. 11. Most of the shops are equipped with from three to a dozen of these devices. Two uprights of bamboo are secured in the ground. These

support the portions of the device as shown. Extending from the top of the two poles is the cross tube, D, for holding the cords. There is a treadle at A. At the right height from the ground for easy work is placed the central board, which consists of a stout piece of lumber of very hard wood, capable of standing strains. On the top of this board is a saw-tooth piece of sheet metal made to correspond with a similar piece, C, fixed to the lever b. The native stands back of this apparatus and grasps one strip of the stock, or saja, as it is called here.

The saja is adjusted on the saw-teeth and the foot applied to the lever, X, thus bringing down the upper teeth, C, on the saja. The saja is now drawn through by hand. The saw-like teeth remove all the fleshy part of the saja, leaving the fine, long and lustrous strands in the grip of the workman. As fast as he secures a handful of the strands, he places them in order over a hook near by. When he gets this hook loaded he stops cleaning and begins assorting. In some works they employ sorters and at fairly good wages, as wages go in this country for natives. The men at the extracting devices told me they were paid twenty cents gold per day and provided with rice and with a place to sleep in the loft of the bamboo shack. The assorters, however, get twice this pay. The overseers receive about forty cents a day each, American currency. These devices for extracting fibre are very cheaply built, so that it can be seen that the cost of equipping the factory is low. Ordinarily the assorting is done in the same works, but the spinning and rope or cloth making is done under other supervision.

THE USE AND ABUSE OF PRESS BOARDS.

Much useful information concerning the use and care of press boards is found in a circular recently issued by The Rogers Paper Manufacturing Company, of South Manchester, Conn. Following is an abstract:

Fenders should always be used if there is room for them, but if there is not, care should be taken that the top and bottom sheets of the press boards, those next to the plate in each book, should always be used in the same position when refilling the press. They will thus act as fenders, but if they are allowed to become mixed in the pack, new burnt sheets will be made all the time.

The manufacturer is often unjustly blamed when the papers become brittle, when the real fault is not with the quality of the press papers, but with the use they have had. It seems almost needless to say that the best press papers ever made cannot be put in too high a temperature in a press without becoming brittle or burnt, and yet experience proves that the amount spoiled by too much heat in finishing goods is much greater than the amount that has to be renewed by becoming too dirty or oily.

A modern press if properly used will pay good interest on the money invested, in the saving of the cost of press paper alone. Such a press is one that will give great pressure, one whose plates are far enough apart when in use to allow the use of fenders to protect the papers. It should be heated with exhaust steam and the discharge pipe from it should not be throttled; pressure, not heat, should be depended on to get the finish.

If a permanent finish is required, subject the goods to a great pressure, heating the plates only about fifteen minutes, or enough to warm the goods thoroughly, and then just before taking off the pressure, run cold water into the plates, thus setting the finish.

Press papers can be furnished with a high or low finish, that is, a hard or a soft sheet. A soft board is likely to be tougher than the high finished one, as it is subjected to less pressure in the finishing, and the fibres can be left longer when making, but it has the great disadvantage of sometimes taking the imprint from the goods. Cases have been called to our attention where a dull finished board has taken the imprint of the goods to such an extent that when placed in the press the pressure was exerted, not on the goods, but on the press boards. We always ship hard finished boards unless otherwise specified.

The first two hundred years of its existence the petticoat (petty coat) was a garment worn entirely by men.

Questions and Answers.

Under this head we undertake to answer, free of charge, to the best of our ability, any pertinent inquiry pertaining to textile matters received from any regular subscriber to the TEXTILE WORLD RECORD. Questions should be stated as briefly and concisely as possible. Inquiries pertaining to textile processes, machinery, improvements, methods of management, the markets, etc., are especially invited, as well as any legitimate discussion on the views expressed. All inquiries must be accompanied by the name of the person inquiring, not for publication, but as an evidence of good faith.

For reply to questions that are not of general interest to readers of textile journals, such as those relating to the composition of yarns, analysis of fabrics, etc., we will charge the enquirer with the cost of the investigation.

Silk Cloth for Cartridge Bags.

Editor Textile World Record:

I would like to know what kind of material is used for cartridge bags by the U. S. Government, its cost, by whom supplied, and whether the manufacture of this material is likely to prove profitable.

Silk Manufacturer.

We have sent Silk Manufacturer two samples of the cloth referred to. No. 319 is used for field and siege guns. No. 320 for seacoast guns. This material has been supplied to the U. S. Government by Ernst Mauersberger, Chemnitz, Germany. No. 319 costs 10 1/2 cents, No. 320 costs 16 3/4 cents per yard, 36 in. wide, at New York. There are no specifications for the goods and contracts are made by the Chief of Ordnance, Washington, D. C., as required. In time of peace the consumption is confined to practice work and is necessarily of small proportion.

Analysis of the two fabrics, 319 and 320, give the following results:

No. 319, for field and siege guns, 10 1/2 cents per yard, 36 in. wide.

Weight, 6 4/10 ozs., per yd. 36 in.
Warp, 47 threads per inch.
Wp. yarn, No. 11 1/2 single spun silk.
Filling, 53 threads per inch.
Fill. yarn. No. 10 single spun silk.
Weave, plain.

Making, allowing for take-up, the spun sizes of the yarn are No. 12 for warp and No. 10 1/2 for filling.

No. 320, for seacoast guns, 16 3/4 cents per yard, 36 in. wide.

Weight, 10 ozs., per yd. 36 in.
Warp, 67 threads per inch.
Wp. yarn, No. 9 single spun silk.
Filling, 50 threads per inch.
Fill. yarn, No. 6 8/10 single spun silk.
Weave, 4-leaf basket.

Spun sizes of yarn, No. 9 1/2 for warp, No. 7 1/4 for filling. Such yarn as in No. 319 costs about 40 cents per pound in this country. Yarn like that in No. 320 costs 35 cents per pound. At these prices the cost of the yarn alone would be 16 cents per yard of No. 319, and 22 cents per yard of No. 320. This is considerably more than the total cost of the German goods delivered in New York, 5 1/2 cents per yard on No. 319, and 5 1/4 cents per yard on No. 320. In addition to the cost of the yarn there would be the expense of spooling, dressing, weaving, fixed charges, waste, etc. On such a basis, it seems useless for an American manufacturer to attempt to compete with the German goods, which come into this country free of duty.

Typewriter Ribbon.

Editor Textile World Record:

What kind of cloth is used for typewriter ribbons? Can you give me a description of its construction? Manufacturer.

Typewriter ribbons are made of fine cotton cloth. An analysis of a sample of this cloth gives the following results:

Warp, 136 threads per inch, No. 75 single.
Filling, 129 threads per inch, No. 108 single.
Weight, 7 7/9 yards, 36 in. wide, per pound.
Weave, plain.

The sizes are as found in the finished cloth. Allowing 5 per cent. for take-up, the sizes of the yarn as spun are No. 79 warp and No. 112 filling.

Pulling Wool.

Editor Textile World Record:

What is the best method of pulling wool from sheep skins? Laprairie (330).

The sweating process was formerly used by which the skins were first saturated in a solution composed of various ingredients mixed with water and then hung up until the wool came off, but owing to the resulting injury to the wool fibre this method has been entirely abandoned. By the process most in use now the skins, if salted, are first soaked in water to remove the salt and a chemically prepared liquor called a depilatory painted with a brush on the flesh side of the skin. The skin is then left in this condition over night during which time the depilatory works its way through the skin and when it reaches the roots of the wool loosens the fibres so they may be easily pulled from the pelt. This process does not injure the body of the fibre at all. The process is patented and from the patent specification we make the following extract:

"It is the object of this invention to provide a simple, expeditious and comparatively inexpensive mode of treatment whereby skins of goats, sheepskins from which the wool has been pulled, pelts and other hides in the hair, or condition which is

sometimes designated "raw stock," may be prepared for and delivered to the tanner in a few hours after their preparatory treatment has been commenced.

"We prepare a more or less hot solution of sulphide of sodium in water. We place twenty-five pounds of sulphide of sodium in a tank or other suitable vessel and introduce water at a temperature of 100 deg. Fahrenheit, more or less, into it. We then put the resulting hot aqueous solution of sulphide of sodium into a drum that may be sealed and rotated, and we add water—for example, twenty ordinary bucketfuls, more or less—whereupon we introduce the skins or hides just as they come from the animal, except, perhaps, that in the case of sheep-skins the wool is previously removed.

"The proportions above described are intended for twenty dozen sheep skins or pelts, so that it will be assumed that that number is introduced into the drum, whereupon the latter is sealed or closed, and rotated for a couple of hours, more or less. The drum, still sealed or closed to the atmosphere, may then be permitted to remain at rest for ten additional hours, more or less—for example, over night. During this time the skins are excluded from the air and are exposed to the aqueous solution of sulphide of sodium and to such fumes of vapors as arise therefrom. Subsequently and after the lapse of these few hours the drum is opened and the skins are washed with water, whereupon they are in condition for tanning."

Another patented invention, calculated to improve the preceding process, is described by the inventor as follows:

"I have discovered that certain known depilatory and other materials of peculiar chemical composition, when at least in part chemically combined by heat eliminate the objectionable features of sulfid of sodium, greatly increase its depilatory power, and constitute a depilatory having a semisolid or viscous consistence adapted to produce perfect skins and wool or hair, and also a true grease contradistinguished from a hard scud. This grease readily melts during the drying operation and imparts weight and softness to the wool or hair and lubricates it, so that it ranks with comparatively high grades, being almost identical with sheared or sweated wool. At the same time the skin or hide is perfect and the operation is sure and free from danger of loss by destruction of the hides or skins or wool or hair.

"The improved depilatory consists of sixty parts of so-called 'hydrated sulfid of sodium'—that is, sulfid of sodium containing polysulfids of sodium—fifteen parts of calcium oxid, ten parts of chlorid of sodium, five parts of barium oxid, five parts of pure surfur, and five parts of powdered charcoal, more or less. Sulfid of sodium containing polysulfids may be obtained from sulfur and sulfid of sodium by the application of heat or boiling, or the hot liquor or "hydrated sulfid of sodium," as it is commonly called, obtained from black ash in the manufacture of sulfid of sodium and prior to the usual evaporation or dehydration contains such polysulfids and may be used.

"The last two ingredients may be omitted, and in such case substantially fifteen parts of chlorid of sodium and substantially ten parts of barium oxid are employed, although the best mode known to me of carrying my invention into effect is to use sulfur and charcoal along with the other ingredients. To these ingredients in a subdivided state and in substantially the proportions specified is added hot sulfid of sodium containing polysulfids in solution, and the mixture is subjected to a considerable degree of heat—for example, 200 deg. Fahrenheit, more or less—with the result that chemical combination takes place.

"As a result the excess of sulfur of the polysulfids of the hot sodium-sulfid liquor combines with unslaked lime or barium oxid, or both, thus causing the polysulfid of sodium to give up its excess of sulfur to the calcium or barium, forming barium sulfid or calcium sulfid without lessening the amount of normal sulfid of sodium present. The proportions mentioned, as well as those that should be employed, are calculated to cause the mass to undergo chemical union under the action of heat and to harden quickly into a viscous or pasty substance of somewhat the consistency of asphalt. The hardening of this mass prevents any chemical change which might occur if the material were in a moist condition prior to its intended use. The proper consistency may be attained by evaporation."

Looms and Spindles.

Editor Textile World Record:

Please inform me how many cotton and woolen looms and spindles there are in the United States at the present time.

Statistician (334).

According to the statistics compiled by the Textile World's Official Directory of the Textile Industry there were in the United States in 1902, 22,601,072 cotton spindles, 520,982 cotton looms, 87,073 woolen looms, 6,124 woolen cards and 1,290 knitting cards. The number of woolen spindles in the United States in 1900 according to the census figures were 3,511,099 and the number of woolen looms in the same year 74,190. There is no data on which to base an estimate of the increase of the cotton and woolen machinery in the United

States since last year. By referring to the Textile World's annual report of mill construction in the January, 1903, issue, Statistician will find statistics showing the growth of the textile industry in this country for a series of years and from them he may be able to make some kind of an approximation of the probable increase in 1903.

A New Fabric for Bandages.

Editor Textile World Record:

Will you kindly inform us what mills manufacture fabric similar to the enclosed sample?

D. L. C. (337).

We learn that this fabric is claimed to be what was used by Dr. Lorenz while operating in this country, and it is called the "Ideal Bandage." It is probably imported. We are not aware of any mill in this country that is making it. The crinkly effect in the warp is obtained by placing side by side, threads of opposite twist, two threads of right hand twist and two of left, etc. After weaving the goods are put through a wetting process, which causes the warp threads to crinkle in opposite directions.

Tying Wool Comforters.

Editor Textile World Record:

Do you know of any machine for tying wool comforters?

Calais (327).

We do not know of any machine for tying wool comforters. If any of our readers know of such a device we wish they would advise us regarding it.

Starching and Weighting Cotton Goods.

Editor Textile World Record:

Enclosed is sample of tape. Can you inform me how I can find out of what the starching is composed?

We are advised that silicate of soda can be substituted for Epsom and Glauber's salts for weighting goods. Will you give us your opinion on this subject? Is there any danger of injuring the goods if silicate of soda is used?

Epsom (348).

A chemist to whom these questions were referred says:

"The greater part of the starching on the sample enclosed seems to be caseine. There are evidently other ingredients, but the piece is too small for an extended examination.

"We see no reason why silicate of soda can not be substituted for Epsom and Glauber's salts in weighting goods, if used in moderate quantities. The only possible objection that could be raised is on account of its marked alkalinity (Epsom and Glauber's salts are practically neutral). Cotton goods would not be injured by it."

Chafing of Boucle Dress Goods.

Editor Textile World Record:

We have large orders on boucle dress goods and are troubled with the chafing of the loops during finishing. The selling samples were scoured by hand when finished and came out perfect, the loop being uninjured. The samples looked so well that we received large orders, but now that we have come to finish the pieces in the regular way we find that the loop is almost entirely destroyed by the finishing process. The result is that the goods are unmerchantable. Can you give us any information regarding the probable cause of this trouble, which is a very serious one with us at the present time? The goods are washed and not fulled, and then piece dyed, rinsed, dried, sheared and pressed.

Capulet (351).

From the details given by our correspondent we judge that the trouble is caused by chafing in either the washing or piece dyeing kettle. As the loops in boucle yarn are very tender it is necessary to handle the goods with great care during the finishing process, otherwise they will be chafed and practically destroyed. Among the causes of this trouble are a too high speed of the washer, or a difference in the circumference of the washer rollers. A great many cloth washers are running with rollers of different sizes in the same machine, as a consequence of which there is a continuous slipping where the rollers come in contact. This will readily destroy the loops in boucle dress goods. Whether the trouble lies in the washer or dye kettle can easily be determined by examining the pieces as they come from the washer and dye house. An excessively high speed of the reel or dragging over the rolls would also be likely to cause the trouble.

Yarn Stretcher.

Editor Textile World Record:

Where can I obtain a yarn stretcher used for removing kinks from cotton yarn?

Kink (355).

William Firth & Co., 150 Devonshire St., Boston, Mass., are the American agents for these machines.

Pennsylvania, Philadelphia. The partnership existing between Mr. Robert Johnston and Charles C. Barger, operating the Allegheny Hosiery Mills at Allegheny Avenue, corner of Witte Street, Philadelphia, has been dissolved by mutual consent. Mr. Johnston will continue the business under the old name, Mr. Barger retiring from the firm.

KNITTING DEPARTMENT.

For Knitting Mill Machinery, Equipment and Supplies, see pages 232 to 253. Also Buyers' Index.

KNIT GOODS SITUATION.

Many buyers are now in the market, but it cannot be said that any great amount of business is being placed. It is a general impression among many that lower prices will be named and there is a disposition to await developments. Selling agents declare, however, that lower prices than those now named are beyond the range of possibility, and that higher prices must be asked in order to show a profitable business. "Last year's prices" are mentioned in some cases, but when the matter is looked into thoroughly it is usually found that the prices only are the same, the goods being altered in some particular to fit the conditions. Manufacturers are basing their prices, generally, on the supposition that cotton will go to 9 1/2c., and where any volume of business has been placed it is on this basis; should it remain about where it now is a number of manufacturers who have sold their product on this basis will find themselves in difficulty.

In going through the situation carefully we find that actual advances of from 2 1/2 to 12 1/2 per cent. are asked. We are assured that the yarn alone in the 25c. balbriggans shows an advance of 15 per cent., and nothing that enters the garment is any cheaper to offset it. The very lowest grade of yarns are being used, the weights lightened, some seams are not covered or drawers are not double seated, in order to get the price down to that usually asked for the popular priced goods.

On the better grades advanced prices of from 10 to 12 1/2 per cent. are asked or substitute garments offered in which carded or tinted yarns are used at same prices as formerly asked for combed. On ladies' ribbed goods to retail at 25c. an advance of 2 1/2 to 5 per cent. is about all that can be discerned. A very handsome line of straight ribbed vests running in prices from $1.75 to $3.75, made by the Southdown Knitting Co., is being shown, and the selling agents report liberal orders on the same. We notice that instead of domestic edgings these manufacturers use almost entirely English vals and torchons in narrow widths. The idea is to get neat effects.

The J. C. Roulette & Co. and Pilling & Madley lines were about the last to be shown, and while an advance of about 5 per cent. is asked on each, buyers who had carried these lines before placed their orders very quickly for them.

Buyers are taking up the 50-gauge light weight balbriggans for another season, quite largely. These are made from combed yarn, and on account of their weight can be sold at a price to enable the retailer to sell them at 50c.

The selling agents for a well known manufacturer of men's fancy colored goods report large business on a line of diamond stitches to retail at 50c. and on a plain colored mercerized line to retail at $1.00. There are also several lines of mercerized ribbed goods shown at from $3.50 to $3.75 in both plain and fancy stitches and open work lace effects; these made with satin fronts make very sightly goods to retail at 50c.

Indications are that white negligee shirts will be worn again next season, and underwear manufacturers are all showing white shirts and drawers.

A critical stage is being reached in the matter of delivering fall goods. About 40 per cent. of the mills are running light on account of inability to get yarns which the spinners are unable to supply on account of inability to get cotton. Jobbers are urging the delivery of goods they have already sold, and we have seen communications from manufacturers stating that to shut down entirely would be necessary within a few days unless conditions change.

The fleeced goods manufacturers met last

month ostensibly to raise the price of their product (of which they had none to sell), but we are informed that the meeting was more particularly for the purpose of deciding on a course of action to be taken in connection with defending any suits that might be brought against them by the patentee of a burr wheel used in fleecing. We understand he had been awarded a judgment of $51,000 against one manufacturer, and was about to enter suits against others.

HOSIERY.

1904 promises to be a season of black hosiery, there being scarcely any call for fancies except in high grade novelties. Laces and gauze lisles have the call, and the demand for laces is being cut into somewhat by the call for the extremely light weight gauzes that are being shown for spring. Manufacturers say that it is impossible to get these goods too light, and gauzy to meet buyer's demand.

Domestic manufacturers have been making all-over lace hosiery in large quantities to retail at 25c., and this has made them common, so that now boot patterns will be more desirable, it being impossible to make these on domestic seamless machinery.

Children's white hosiery, particularly for misses, promises to be good property another season. They are very popular in the larger eastern cities now, and will probably become so throughout the other sections next spring.

Black half-hose will also have the call in both plain and with small, neat embroidery. Gauze lisles are finding ready sale, and we have seen some excellent value in 200 needle goods at $1.85.

Granite shades with embroidered figures and clocks at from $1.80 to $1.85 are also selling largely.

CHEMNITZ REPORT.

At present all manufacturers are busy getting up spring samples, and so far opinions are very much divided as to what will be good sellers. Orders are being placed sparingly, buyers evidently depending on duplicating on most salable lines.

Manufacturers are hampered with late deliveries of yarn, and some are notifying buyers that deliveries will be from six to eight weeks late.

The demand for lace hosiery still continues but is not near as large as former seasons. The call is principally for better grades in the more serviceable patterns, the very lacy ones being left out. Lace boot patterns are in better demand than last year, probably owing to their being more serviceable than the all-over lace patterns.

Extracted and injected goods are being called for in white grounds with black and colored figures, also black with white figures. A ready sale has also been found for striped goods with injected spots, rings and fancy figures.

Embroidered goods are the most popular in the fancy line and small, neat effects are preferred.

A prominent feature is the extra fine gauze silk finished goods being shown to retail in the United States at from $1.25 to $2.00. These can hardly be told from the real silk goods. They are made with garter tops and spliced seams to make them more durable, and many buyers are taking them.

Glove makers are all busy, and indications are that deliveries will be four to six weeks late, especially on lined goods. A good number of duplicate orders have been received lately for cashmere and cashmerette gloves, also a few for ringwoods, in liberal quantities.

The coming spring promises to be a very good one for silk gloves, and already some manufacturers are sold up for the season, particularly those who have looms to make tipped fingered goods. Much better material is used in the plain fingered goods, made possible by difference in cost of putting in tips, which is considerable.

Lace gloves and mitts have not been bought to any extent.

Berlin cloth and fine lisle gloves with two clasps are being bought largely, also those made with Berlin or silk cloth palm and lace net tops. Some of these are sold without points, but may be had with fancy hand-embroidered points, making very showy gloves.

LEADED NEEDLES VERSUS TRICK NEEDLES—II.

BY S. X.

In the first installment of this article the subject was discussed in regard to theoretical considerations, first cost, and operating cost. Take next the flexibility. The lead needle cylinder may contain more or less needles, according to accident or design. The trick cylinder can contain only a fixed number of needles. Each of these properties are at times advantageous and the reverse. For pattern work it is, as a rule, necessary to have the number of needles in a fixed relation with the width of the pattern. For instance, a vertical stripe ten wales in width requires that the needles divide by ten. A diagonal stripe ten wales in width frequently requires that the needles divide by ten with a fixed remainder.

Suppose that a pattern is to be made with ten wales in width. Take the leaded needle cylinder first. The knitter counts the needles in the cylinder, for he cannot be sure from month to month that it does not change by as much as one or two needles. Assume that the total number divides by ten with a remainder of five. Then choice may be made between adding five needles or taking out five needles. If they are to be added, all, or a large proportion, of the needles should be taken out of the cylinder, and each lead taken out filed very slightly across one side. This may best be done by placing a broad file on the bench and passing each lead once across it lengthwise. Then replace the needles in the cylinder and there will of course be room for more needles than before. If there is not enough room for five extra needles the process must be repeated. Every cylinder on which the pattern is to be made must be treated this way. If the five needles are to be taken out, the usual method is to take the mould apart and place a piece of tissue paper between the mould plate and the side to which the plate is attached, thus widening the space in the mould and consequently widening the leads, so that the cylinder will contain less needles. By trial the right thickness may be obtained for practical purposes. Different thicknesses of paper must be used for cylinders of different sizes. It is obvious that both these methods are objectionable, as the space between every second needle is decreased or increased from the normal spacing, and as the gauge of the cylinder is made finer or coarser. For practical purposes slight changes in the number of needles cause no appreciable trouble, but greater changes do cause trouble. After these changes are accomplished it requires much care to keep the mould and metal so that the leads will not crowd each other with continued use.

Now make the same supposition in regard to the trick cylinder, namely that a pattern ten wales in width is required. If the cylinders have been cut with a view to making pattern work it is likely that the nominal diameters have been varied slightly so as to make the number of needles in each cylinder divisible by say 60, which is obviously sub divisible by 2, 3, 4, 5, 6, 10, 12, 15, 20, and 30. As 10 is in the list, the problem is solved at once, and no changes are necessary. Moreover, this will hold for all the different sized cylinders so that there is no trouble in getting the same pattern for all the different sized garments. The question of crowding the needles cannot occur as each needle has its own space, and if, as assumed, the nominal diameter of the cylinder has been changed so as not to change the gauge, then the spacing is not altered as is the case with the leaded needle. If the trick cylinder has not been cut so as to permit of the pattern, then that pattern cannot be made on that cylinder.

Now take the cases in which the number of needles must be changed from odd to even or the reverse. These are common, not only in pattern work, but in fleece work in making diagonals in the face or backing. With the trick cylinder such a change is impossible, but with the lead needle cylinder it is a comparatively simple operation.

Again it is not unusual that the diameter of the needle wire should be changed. With a given needle the stitch must be long enough to allow the needle to pass through it without undue resistance. Now if a shorter stitch is required the diameter of the needle must be decreased. At other times it

is required to duplicate a sample, as when one mill oversells and is obliged to let out some of its work. The only way to duplicate the sample is to duplicate the operating conditions, among which may be the diameter of the needle. With the lead needle cylinder these changes may readily be made by a slight change in the mould, but with the trick cylinder, a change to heavier wire cannot be made, for the tricks would be too small, and only a trifling change to lighter wire is permissible, as lighter needles would not be securely held.

Consider now the question of changing the gauge. With the lead needle cylinder the cost is for the mould only. With the trick top cylinder, the cost is a new trick top for each cylinder, and in the case of the one piece trick cylinder it is for entire new cylinders. Assume the case of a mill with fifty cylinders, and for argument put the cost of a mould at $12, a trick top at $15, and a new trick cylinder at $45. Then the cost of changing the gauge (omitting the cost of burs, which would be the same in each case) would be as follows: Lead needle $12, trick needle with removable trick tops, $750, trick needle with one piece cylinder, $2,250.

Summing up for flexibility, we find the trick needle superior in regard to considerable change of pattern, inferior in regard to change of gauge, and out of the question in regard to change of needle wire or change of number of needles. The lead needle cylinder is adaptable to all of these changes, but considerable change in pattern is at the cost of much annoyance and consequent trouble in operating.

Consider next the durability of the two systems. With the lead needle the tricks are two in number and every pair of needles used has to go in and out of those tricks during the operation of casting the leads. The result is rapid deterioration of these tricks, but as there are only two of them, the question of repair is a simple one, and repairing those two tricks repairs all the cylinders, as far as the needles are concerned.

With the trick cylinder the tricks are distributed all over the knitting room, one for each needle in use. These tricks are not subject to incessant wear of inserting and withdrawing the needles, for once a needle is inserted it stays there for the rest of its life, but the wear is caused by the working of the needle in its contact with the pressers and burs. Consider a needle in a four feed plush cylinder making sixty turns per minute. In one second that needle is sprung 28 times, not to mention sundry minor flexures. Four times each second, at each backing bur, the spring is considerable. Taking ninety working days as the life of a needle, this means that the needle is flexed over ninety million times. This flexure of course gradually wears the tricks at the upper edge of the cylinder so that in time it is difficult to hold the needle securely.

So much for the wear due to use. Consider now the wear, or more properly tear, due to accident. It is not unusual for a bur to get caught and to bend down a lot of needles as a storm lays down growing grain. The bend in the needle comes at or near the point of support and injures that support to an extent. In the trick cylinder this injury remains. In the leaded cylinder the injury is done to the lead, which is discarded for a new one, so that no permanent injury results.

The wear in the tricks of both systems has been considered. Take now the wear in the hub of the cylinder. When a cylinder gets loose on its spindle it runs out of true and causes bad work. The wear occurs of course both on the stem and in the hub, but as a rule it is greatest in the hub. The lead needle cylinder may be chucked, bored large, bushed and reamed, and then put on an arbor and scraped true on the needle bed, thus making it practically as good as new and at a cost of from 1/5 to 1/4 its original value. When the trick cylinder is worn in the hub the only way to repair it is to replace either cylinder or hub.

Depreciation properly comes under the head of durability. For illustration, consider again the mill with 50 cylinders, and assume that it is equipped with one change of gauge throughout. With the lead needle cylinder, the change of gauge is represented by a needle mould hanging on the wall. It may rust and probably will. The cost of repair when needed would be possibly $6, and the cost of replacement $12. The cylinders are

in constant operation and are consequently kept clean and bright. On the other hand take the trick cylinders, those with trick tops first. Using the figures already assumed, the change of gauge is represented by 50 cast iron discs from say 13 inches in diameter to 24 inches in diameter. The periphery of each of these discs contain from six hundred to eleven hundred tricks. It is needless to say that each disc should be carefully wrapped and carefully cared for, but what should be done is one thing and what is done is frequently another, and it often happens that a lot of valuable trick tops will be piled in a corner with a lot of other extra parts and allowed to rust until needed. It is then out of the question to get them back on the cylinder to run properly and it is a tedious task to clean and repair the rusted and bruised tricks so that they will hold the needles properly.

In the case of the one piece trick cylinder the change in gauge is represented by $2,250 worth of delicate machinery, which is much more bulky than the trick tops, the tricks of which are to an extent protected by the needle caps, but which are otherwise quite susceptible to damage. Summing up for durability, the lead needle cylinder has the advantage.

Take finally some miscellaneous considerations. Advocates of each system claim that theirs is superior in regard to the rigidity with which the needle is held. Comparing the two systems we find for the lead needle as follows: The needle cast in a metal base not as hard as type metal, but harder than solder, and this base quite securely clamped at some distance below the needle. For the trick needle we find: The needle standing in a groove in cast iron, the bend in its shank inserted in a well fitting hole at right angles to the groove and the needle held in position by a thin sheet of leather backed by a cast iron cap.

When the leaded needle is sprung, under the action of the pressers and burs, the tendency is to press back the metal from around the wire making a conical opening where the needle emerges from the metal. This opening is usually so slight that a magnifying glass is needed to distinguish it. Occasionally a needle will work loose in the lead and make a line until replaced.

With the trick needle the side support is firm, as the needle is partially enclosed on the sides by cast iron. The support resisting inward bend is not firm, as it is resisted by the leather, the iron backing acting as a fulcrum. With continued wear the tricks become conical at the top, thus decreasing the stiffness of the needle. The bearing of these considerations is obvious when it is remembered that the evenness of the stitch depends on the stiffness of the needle, other things being equal, for the stitch is formed by the blades of the sinker pressing the yarn between the needles, and if one needle bends more than its neighbors the stitch formed at that needle will be shorter than the others; also, a weak needle requires the pressers to be set deep in order to close the point of its beard into the eye, and consequently the other needles have to be unduly pressed in order to clear the weak one of its work.

In the lead needle cylinder, the remedy for a weak needle is to replace it. In the trick cylinder the same remedy is available in regard to the needle itself, but if the trouble lies in the needle support, as is frequently the case, the trick must be packed, usually with paper placed behind the needle in order to brace it up to its work.

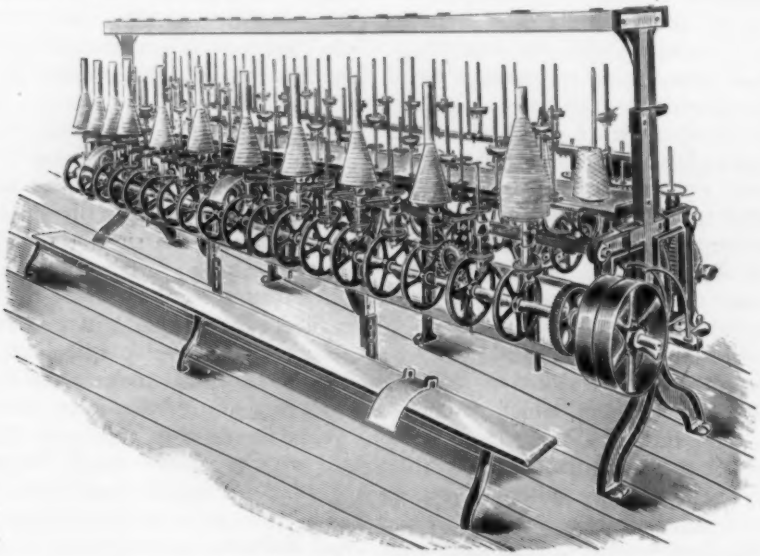
A difficulty with trick needles that does not occur to any extent in lead needles is that of holding the needles properly where the needle caps break joints. With the lead needle the available width for holding the lead is that of two needles and their needle spaces, but in the trick cylinder it is merely the thickness of the needle, and unless the caps are very carefully fitted and adjusted the needle between them works loose.

The paduasoy of our grandmothers was a smooth silk manufactured at Padua, Italy. It has now reappeared under the name of peau de soie.

The value of pineapple fibre for textile purposes has long been known, but so far no mechanical device has been constructed to separate the fibres from the leaves satisfactorily.

THE NEW IMPROVED ALLEN WINDER.

Our illustration shows the Allen yarn winder, which has recently been reconstructed on new and improved lines and is now offered to the trade with every confidence on the part of the builders that it will meet the many varying requirements of different classes of goods and kinds of yarn.



THE NEW IMPROVED ALLEN WINDER.

The body of the machine is made entirely of iron and steel and every part is firmly bolted to a faced surface keeping the spindles and guides parallel, thus insuring perfect shaped bobbins. Each spindle is independent and runs in brass lined bearings, cut gearing is used entirely on this machine, thus making as little noise as possible.

This winder will wind all sizes of bobbins with equal satisfaction from the small full fashioned to the large bobbins used for sweaters and underwear. The skein winder has a positive gearing, fast and slow motion which allows the most delicate yarn to be wound without any trouble.

The cone and cop winder has been made to take up as little room as possible, being only three feet three inches wide over all on a double sided machine. This is a very important item as most manufacturers need all the floor space they can get. The floor under the machine is entirely clear, this making it easy to keep clean. Good winding makes good fabric and saves a large per cent. of waste and broken needles.

Full information can be had in regard to these machines by addressing the maker, A. W. Allen, 2427 N. Mascher St., Philadelphia, Pa.

KNITTED ASTRAKHAN CLOTHS.

BY F. W. HERINGTON.

It is so many years ago that knitted astrakhan cloths were extensively made that they are almost forgotten. I have no doubt that a large number of the younger knitters of today do not know anything about them, and some perhaps have never heard of them, and that it is only a few of the old knitters who can remember them and the time they were quite popular.

It was between the years 1884 and 1888 that knitted astrakhan cloth as well as Jersey cloth and boucle cloths were being knit and sold. They were manufactured largely in Philadelphia at the time the Jersey cloth was being manufactured. These cloths were made in some of the Eastern mills also, but very little among the mills in Cohoes and Amsterdam. In the Philadelphia mills they

were made mostly on flat knitting machines similar to a loom, but in the Eastern mills they were made on the spring needle circular machine of the Tompkins and Crane make.

After being knit the goods were sent mostly to the dyers in Philadelphia to be finished for the market, and they were dyed and finished similiar to woven goods, such as tweeds etc., and were sold by the yard, and in single and double width, being 27 in. wide for single width, and 54 inches for the double. As also

were Jersey cloths, and in this shape were sold to the makers of Jersey waists, astrakhan jackets, etc.

Fig. 50 is an illustration of astrakhan cloth made on a spring needle 24 circular machine with four feeds. The back of the cloth being the face as knit, and which is composed of white cotton yarn in two threads about No. 30's, cotton number. One of the face threads being used for a "binding" thread to tie in the astrakhan thread, the same as the "backing" thread in plush or fleece knitting. The back of the cloth as knit is the face or astrakhan side as sold. The astrakhan side is composed of lustre worsted yarn and is usually a very coarse number, about No. 4's in worsted number.

This backing or astrakhan thread was put in (by some knitters) by using a "backing" burr or wheel, and fastened by the "tying" in thread as above mentioned, all the same as in plush or fleece knitting, only that it was not tied in regularly after the same number of needles (which in plush is every third needle), but at irregular intervals, for instance every 5th or 6th needle for several times and then every 7th, in fact the more irregular this tying-in was done, the better the effect of the astrakhan when finished.

This astrakhan thread was not put in on every feed, as in double plush, but only on about every 4th feed, that is to say, there would be 3 feeds or courses of plain knitting in succession, and then the 4th feed or course would have the astrakhan thread tied in with the "binder" thread. In Fig. 50 the astrakhan thread is every 4th feed.

The astrakhan thread, being a very coarse number of yarn, not only filled up the intervening space of the 3 courses of plain knitting, but also gave a heavier pile to the astrakhan.

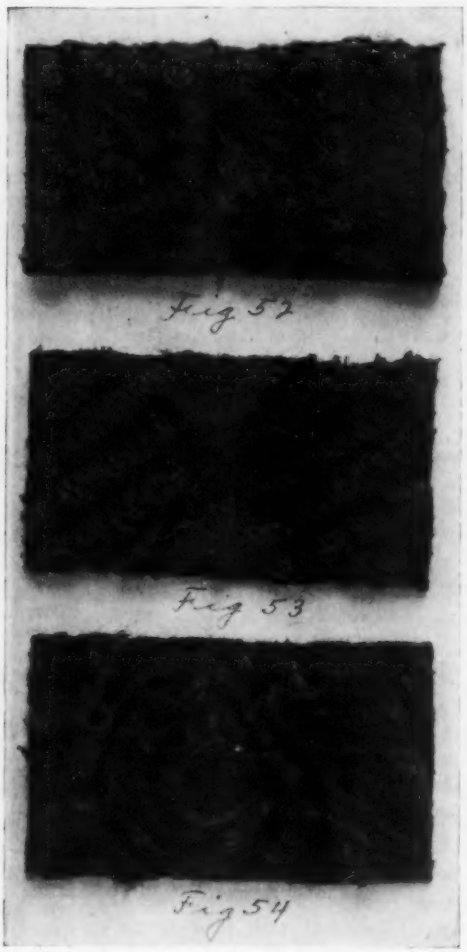
The curly effect of the astrakhan thread as appears on the cloth, comes naturally after the dyeing and finishing, and is owing to the curly properties of the lustre worsted yarns, and not to any process or method of knitting.

Fig. 51 is another illustration of astrakhan cloth. This was made on 12 gauge, whereas the sample of Fig. 50 was made on a finer gauge (24) and with four feeds on the machine also. But the "curly" effect of the astrakhan on this sample looks finer than the other one. This was produced by using a finer number of the "lustre" worsted yarn for the astrakhan thread, and putting in this thread every other feed, instead of every 4th feed. This would cause the astrakhan thread to lie closer together, that is to say there would be one feed or course of plain knitting, then the next would have the lustre worsted thread tied in and then repeat.

Fig. 52 and 53 are astrakhan cloths show-

ing a distinct pattern on the back or astrakhan side.

To produce these pattern effects on the back, two wheels were used in place of the backing burr for putting in the astrakhan



thread, but the method of tying it in was the same as in the others.

A round wheel was used having steel blades in it, and a groove all around it, so as to hold the yarn as received from the yarn guide, and this wheel was run directly over the tops of the needles, and at the point where this wheel engaged the needles, the needles were pressed backwards by a "Kinsey" needle presser, so as to permit the yarn being laid in between the needles. This was a tuck needle presser with movable and adjustable blades or wings so that it could be set for almost any pattern desired either for tuck needle presser work in patterns and designs and also for patterns as shown in these astrakhans. Other tuck needle pressers were required to be cut for each different pattern or design, whereas the "Kinsey" presser could be set and thus used for any desired number of patterns.

Fig. 54 is an illustration of boucle cloth and was made in the same manner as the astrakhan cloths showing four feeds and every 4th feed the backing thread tied in at irregular places in the face of cloth as knit, except that in the boucle cloths mohair yarn of finer numbers was used; mohair yarns when finished have a glossy and silk look, which cannot be seen in the illustration.

The curl in the cloth as seen, came naturally in the finishing by the elasticity of the knitted cloth coming together after knitting, and further by the contraction of the cloth when being dyed, as well as the curly nature of the mohair yarn. These cloths as well as the astrakhans were made on large cylinders, usually 30 in. diam. to make the cloth wide enough so that after finishing it would measure 27 inches single and 54 inches double width when opened out.

All these knitted cloths had a great run for the few years in which they were popular and were used not only for jackets, Jersey waists, etc., but,the boucle cloths were used even for skirts and also for trimming fall hats for ladies' wear.

The Jersey cloth waist was the most comfortable garment ever made for ladies; it had the several advantages of being tight fitting and yet gave more freedom of action than any other tight fitting garment ever made owing to its elasticity, while it always fitted, because it conformed to the shape of the waist. It was light and durable and dressy, and never showed any creases, nor required any laundering as the present style of shirt waists do. I have no doubt a large number of ladies would welcome the comfortable Jersey cloth waist back again, if it should come out once more.

UNIFORM SHADES ON CHEAP COTTON HOSIERY.

Low grade cotton yarns, and such yarns as are uneven in twist and correspondingly so in count, when knitted into underwear produce articles that are difficult to dye level shades unless the operation is conducted slowly, which increases the time and the cost.

In handling such goods, however, it is found best to wet out previously in water heated to 160° F., and containing about three pints of soluble oil. This has the property of causing more thorough penetration of the dye liquor. From the wetting-out vat, transfer the hosiery to the dye-vat, heated to 160° F., and containing about one-third of the dyestuff. Work by poling for ten or fifteen minutes, during which time the temperature is allowed to gradually increase. The remaining portion of color is to be gradually added, the last addition being made just before the vat boils. It is needless to remark that the dyes should be dissolved previous to use, and preferably strained. As nearly all the hosiery for spring, summer and autumn wear is dyed with the direct colors with salt, the precaution of previous solution is recognized.

The sulphur browns and blacks, when used for all depths of shade, should be dissolved, and small quantities added to the main dye-vat so as to build up the shade to the proper depth. For universal use, the sulphur colors are the very best suited for underwear because they do not crock or fade. When after-treated with copper or chrome salts, they are superior to any known classes of colors.

Light blues, light tans, pinks, and similar shades for all classes of underwear require attention at every stage of the dyeing, to ensure freedom from spots and other unevenness, and the longer the time of immersion in the dye-bath and the slowness of the boil, the more satisfactory will be the results.

The use of compounded dyes for the production of delicate shades is to be deprecated on the part of the dyer, whose object it should be to build the proper shade by the cautious addition of the proper component colors that are necessary to give the desired shade.

RECENT KNITTING PATENTS.

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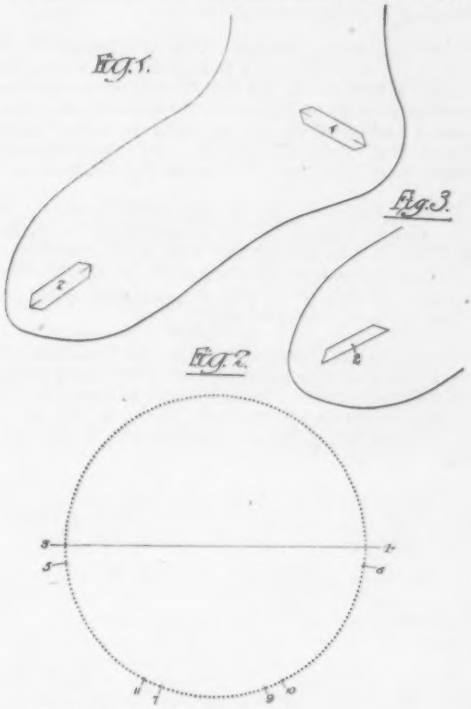

W. Scott, Philadelphia, Pa.

The object of this invention is to produce a sock or stocking of the character known as "seamless," but having a better shape in the heel and toe than such stockings usually have. This object is attained by providing the heel and toe pockets formed upon the knitted tube with a taper-ended gusset at each side.

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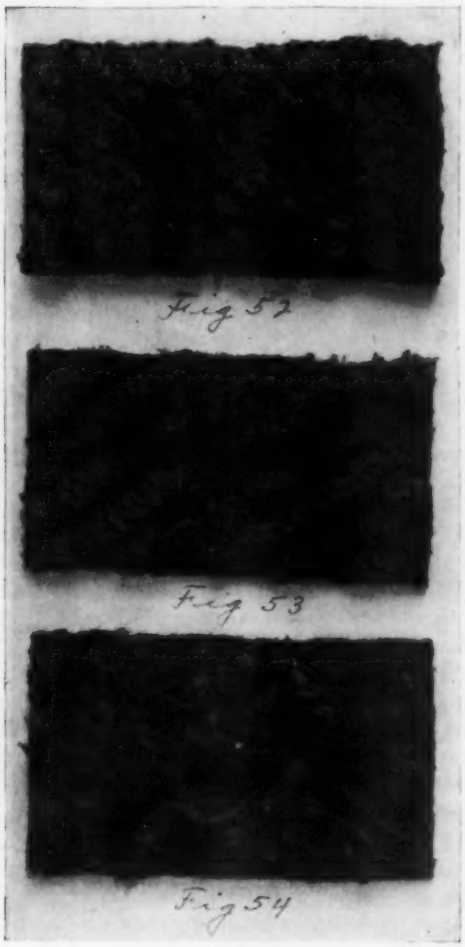

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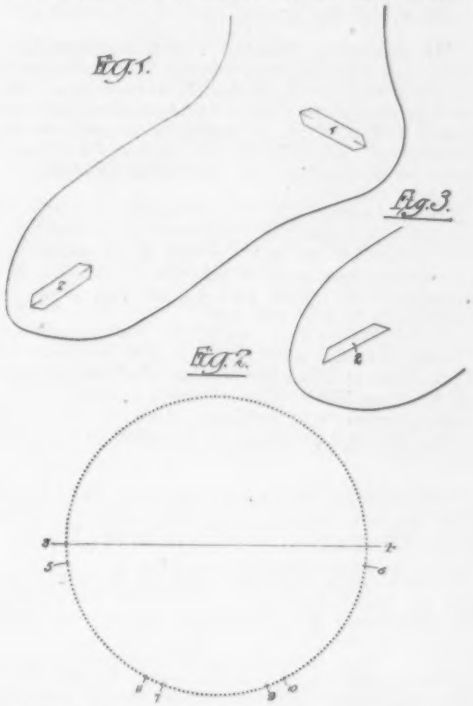

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In the accompanying drawings, Figure 1 is an outline view of part of a sock or stocking, showing the character and location of the heel and toe gussets formed therein. Fig. 2 is a diagram representing the needles of a circular-knitting machine for the purpose of conveying an understanding of the various knitting operations used, and Fig. 3 is a view of a modification of the invention.

STOCKING. Seamless Fashioned. 732,034. James F. Bard, Winston, N. C.

KNITTING MILL NEWS.

New Mills.

Georgia, Barnesville. The Empire Knitting Mills, with a capital of $25,000, is being organized at this place. H. H. Gray, E. L. Rogers, W. C. Jordan and W. M. Howard are the incorporators. They expect to begin construction at once.

Massachusetts, Mattapan. A two-story knitting mill, 30 by 104, is being built on River St., on property owned by J. B. L. Bartlett.

*New York, Fultonville. The new Sovereign Knitting Mill has started up.

*Massachusetts, Quincy. The Cambridge Knitting Mills, capitalized at $6,000, E. W. Chapman, president and C. A. Campbell, treasurer, are located at this place. They make sweaters for men, women and children. A specialty is made of the "Cambridge Jacket." Goods are sold through Chapman & Campbell, 68 Essex St., Boston.

*Ohio, Leipsic. H. J. Griswold, formerly of New Haven, Conn., has been secured by the Leipsic Hosiery Co., to put the mill in operation and give instructions as to managing the plant. The capacity of the plant will be not less than 100 dozen pairs of hose per day.

Pennsylvania, Forest City. A new knitting mill is projected at this place, to be called the Anthracite Knitting Mills. Capital stock, $15,000. L. M. LaBarr, formerly of Saginaw, Mich., is the prime mover, and will probably be manager of the concern.

*Pennsylvania, Hamburg. James L. Merkle will have his new hosiery mill ready for operations about September 1st. Goods will be sold direct.

*Pennsylvania, Reading. Lieb & Brossman expect to start operations in their new plant about July 6th. They will make men's goods, using 14-16 yarn.

*Texas, Hillsboro. The Hillsboro Hosiery Factory, which was burned out in March, has just been restarted by E. L. Sessions, proprietor. J. B. Jennings is superintendent and manager of the plant, which is equipped with 6 knitting machines. They buy yarn from 10 to 20.

Texas, Weatherford. G. M. Bowie and others are interested in the establishment of a knitting mill at this place.

*Virginia, Roanoke. Mr. Daniel Robb and Charles Michael are about to start up in the manufacture of cotton hosiery for children and men. They have already secured a mill 40 by 80 feet, three stories high, and expect to turn out 500 dozen a day. The goods will be sold direct. The machinery to be used is both new and second-hand, but up-to-date. Mr. Michael is now engaged in the manufacture of hosiery, operating under the name of the Crescent Hosiery Mills at 310 Master St., Philadelphia, while Mr. Robb is engaged in the cotton yarn business on Chestnut St., above 2nd. They have consolidated their interests and expect to have the plant in full operation in about three weeks. The new company they expect to run under the name of the Roanoke Knitting Co.

Washington, Tacoma. Ward H. Cramer will establish a small knitting mill at this place. He has most of his machinery, to manufacture underwear, sweaters and goods of a similar character.

West Virginia, Berkeley Springs. Messrs. Wingert & McCutcheon of Hagerstown, Md. and V. A. Norris, of this place, are interested in establishing a hosiery mill here. Details of the plant have not yet been decided.

Enlargements and Improvements.

*Georgia, Barnesville. The Oxford Knitting Mills will make addition to the plant during August or September. They now operate 50 knitting and 100 sewing machines. T. E. Minhinnette is general manager of the company.

Massachusetts, Shelburne Falls. The Orange Knitting Co., of this place, has purchased the equipment of the Amsterdam Knitting Co.'s plant at Hoboken, N. J., and will remove part of the machinery to mill in Shelburne Falls, and some to Farley. They would install about 150 of the machines purchased in plant here if sufficient employees could be secured.

Michigan, Muskegon. The Amazon Knitting Co. is to give up the manufacture of woolen goods, and extend its facilities for cotton hosiery. It is understood that there is some talk of putting in spinning machinery. Many changes will be made in the equipment, and dye house will be renovated.

New York, Amsterdam. New knitting machinery is to be installed in the Liddle Knitting Co.'s mill.

New York, Cohoes. The Star Knitting Mills advise us that in addition to their regular supply, they are adding 12 Scott & Williams frames for men's wool ribbed goods.

New York, Lyons. The Gloversville Silk Mills will establish a branch plant at this place for the manufacture of silk lined gloves.

*New York, Sherburne. The Canasawacta Knitting Co. advises us that they will not install new machinery right away. They are completing new boiler house and putting in new boiler and have recently completed erection of new dye house and addition to old one, doubling capacity.

*New York, Utica. C. H. Yates & Co., of the Athletic Knitting Co. and Utica Hosiery Co., advise us that the additional building which they have token will more than double their present space, and they expect to add machinery within the next few months.

New York, Waterford. A new dye house has been completed recently for the Eureka Knitting Mill, J. H. Pynes, proprietor.

North Carolina, Newton. A one story addition is being built to the Newton Hosiery Mill, increasing the main building to three stories. Sixty additional knitting machines are being added. Work has been recently completed on erection of a new warehouse and office building.

Pennsylvania, Cardington. The Cardington Hosiery Mills in this town are now working only half time, this being between seasons. The dyehouse erected by them is now fully equipped, enabling them to dye and finish their goods on the ground, an addition of 5 machines have been added making their full complement 20, the product being 100 dozen a day. Mr. Harry Harder is the superintendent.

Pennsylvania, Clifton Heights. Messrs. Crawford & Quinn, operating under the name of the Columbus Knitting Mills, report being very busy manufacturing fine gauge ladies', misses', and infants' hose. The machinery equipment of this plant consists of 3 full fashioned machines and 125 knitters. A new dyehouse has just been added for dying colors and fast black.

*Pennsylvania, Hazleton. Work is nearing completion on Wilde & Co.'s new knitting mill. The building is ready for installation of the machinery.

Pennsylvania, Milton. Work has begun on erection of a new dye house for the West Branch Hosiery Mills.

Pennsylvania, Philadelphia. The Allegheny Hosiery Mills, which have been located at Allegheny Avenue and Witte Street, for some time, have been removed to Trenton Ave. and Susquehanna Ave. These mills were formerly run by Johnston & Barger; Mr. Barger has since retired from the firm, Mr. Johnson being the sole proprietor. The mill is run on high grade seamless hosiery with 50 machines.

Pennsylvania, Philadelphia. The Somerset Knitting Company, 2420 Waterloo Street, Philadelphia, has been sold out to Messrs. Breyer & Vogel, who will continue the business at the same address. The new company will manufacture fine seamless cotton hosiery, operating 15 machines which they expect to increase in the near future. Mr. Breyer is an expert dyer and finisher of hosiery and states that as soon as the business permits they will put in the necessary machinery for the purpose of dyeing and finishing their own product.

*Pennsylvania, Reading. The Stork Knitting Mills have completed erection of a two-story addition to the plant.

Pennsylvania, Reading. The Mount Penn Knitting Co. has shut down for a few weeks, in which time improvements and changes in the plant will be made.

*Pennsylvania, York. The addition to the York Knitting Mill Co.'s plant is under roof.

*South Carolina, Blacksburg. At a meeting of the stockholders of the Blacksburg Spinning and Knitting Mills, of which H. D. Wheat is receiver, it was voted to increase the capital stock, as was reported in our issue of June 20th, and add 20 new knitting machines and auxiliary machinery to the mill, which will shut down several weeks pending improvements.

*Tennessee, Nashville. Messrs. J. H. McPhail and Justin H. Thomas have acquired complete ownership of the Nashville Hosiery Mills. Mr. McPhail will be the active manager. They will make cotton ribbed hosiery. Extensive additions will be made and new machinery installed and dye house will be entirely remodeled and new machinery put in.

Mills Starting Up.

*Connecticut, Norfolk. The Norfolk & New Brunswick Hosiery Co. is running some of the machinery, and hope to have machinery running in full soon.

Georgia, Barnesville. The Gem Knitting Mill Co., which was chartered last November to operate the Hanson-Crawley Mill, has started up. The present officers are: J. L. Kennedy, president; J. L. Fogg, vice president; J. P. Thurman, secretary and treasurer. J. W. Hanson has been engaged as superintendent.

*New Jersey, New Brunswick. Alfred March & Co.,s mill, which was recently damaged by fire, is running. They contemplate having the entire plant in operation within a month.

Mills Shutting Down.

Connecticut, Plainville. The Plainville Mill of the Bristol Mfg. Co. is shut down and repairs and alterations are being made. This plant was recently acquired by the Bristol Co.

New Hampshire, Manchester. The Manchester Stocking Co. has shut down on account of price of yarn.

New Jersey, Hammonton. It is reported that the branch mill of the Newville Knitting Co. will be removed to Newville, Pa. This has been caused by the high price of cotton making it unprofitable to the company to run an extra mill.

New York, Amsterdam. The Gardiner & Warring Co.'s underwear mill has been closed on account of the high price of yarn.

New York. Cohoes. The annual shut down when the water is drawn from the canal is the week of August 3d.

New York, Waterford. The Kavanaugh Knitting Mills close from August 1st to August 10th for repairs.

Pennsylvania, Philadelphia. Waterhouse Brothers, who purchased and operated the knitting plant

of C. & G. Sasman at 1931 Hope Street, have discontinued operations and are offering their machinery for sale. This was caused by the fact that the Messrs. Waterhouse were engaged in another business which necessitated their entire attention.

Pennsylvania, Philadelphia. Any change in the mill situation here seems to be slightly in favor of the employers. A number of knitting mills have started up, but the cloth mills and dye works are largely closed. The general impression is that the employers will stand firm and win out before long. Such mills as have started up will close down Thursday night for over the Fourth.

Pennsylvania, Souderton. M. B. Bergey & Co. are to remove their branch hosiery mill at Coopersburg to Souderton.

Facts and Gossip.

Georgia, Griffin. The Griffin Knitting Mills, which recently enlarged their plant, have incraesed their capital stock $5,000, and are going to issue $25,000 additional preferred stock.

New Hampshire, Nashua. The Lucy Baker Knitting Co. is now a branch of the Hitchcock & Curtiss Knitting Co., Hartford, Conn., and now goes under the name of the Nashua Knitting Company. Mrs. Lucy Baker is superintendent. They operate 60 knitting machines on gloves and mittens.

New York, Amsterdam. The Amsterdam Knitting Co. has been incorporated with a capital of $30,000. This is the business of Waldron & Cassidy, and the same parties interested are directors in the new company.

New York, Fultonville. At meeting held recently by the stockholders of the Sovereign Knitting Company, the following directors were elected: Carlton W. Zeyst, Leopold Lovenheim, Sidney F. Peddle, William B. Conney and W. Fenton Myers. They contemplate starting the plant in the middle of July and hope to have same in full operation before end of the month.

New York, Little Falls. The Victor Adams Manufacturing Co. has petitioned state to change name to the Little Falls Manufacturing Co.

New York, New York. The Balfron Knitting Co. has been incorporated with capital stock of $30,000 by Jas. Risk, B. A. Taber and R. D. Johnson.

Ohio, St. Marys. St. Marys Knitting Mill has increased its capital stock of $50,000 to $100,000.

Ontario, Almonte. The Anchor Knitting Mill Company has increased its capital stock from $50,000 to $150,000.

*Pennsylvania, Falls Creek. Site has been selected for erection of new plant to be probably operated as the Falls Creek Knitting Mills. Dr. R. M. Boyles president of the Board of Trade is interested in the project, and will call meeting to see what can be done to secure project at this place.

Vermont, Bennington. The real estate and buildings of the Valentine Knitting Co., which have been dismantled of machinery, have been sold for a paper mill.

Virginia. Portsmouth. The Salem Knitting Mill, of which John P. Sheppard is proprietor, is being removed from Salem, N. J., to this place. It is a hosiery mill of 200 machines.

*Virginia, Winchester. The Lewis Jones Knitting Co. advises us that they discontinued mill at Brunswick, Md., on account of inability to get sufficient help. They have as yet made no arrangements for disposing of the hosiery department.

*Vermont, Bennington. The Coy-Babcock Co. of Bellows Falls, has purchased the Valentine Knitting Co.'s mill and will put same in operation making waxed papers.

PERSONALS.

C. F. Gonson is the new knitter at the Holroyd Knitting Mill, Albany, N. Y.

John Dunlap, superintendent of the Riverside Knitting Mills, Cohoes, N. Y., has resigned, and J. Aiken, Philmont, N. Y., has succeeded him.

George Barr is the assistant superintendent of the knit works at the Manchester, N. H., Mills.

O. M. Whitbeck has accepted the position of superintendent with the Chickamauga Knitting Mills, Chattanooga, Tenn.

William Ross has withdrawn from the firm of Smith Brothers & Ross, proprietors of the Birdsboro (Pa.) Knitting Company.

William J. McGuire has resigned as overseer of knitting at the Glenark Mill, Woonsocket, R. I.

Geo. H. Jepson, for several years vice-president and general superintendent of the Valentine Knitting Co., Bennington, Vt., has severed his connection with the same. He has been connected with the plant in various capacities for over thirty years.

Richard Arnold, late of Woodbury, Conn., has accepted the positon of secondhand of card room for the Paragon Knitting Co., Mohawk, N. Y.

Harry Gill, overseer of the latch needle department of the Penman No. 2 Mill, Paris, Ontario, resigned recently.

S. H. Yearbey, late of the West Huntsville Mill, is now overseer of spinning at the Rowe Knitting Mill, Huntsville, Ala.

E. M. Spoor, formerly master mechanic at the Eagle Mills, Little Falls, N. Y., is now connected with the Fisher Knit Goods Company, Utica, N. Y.

New Machinery and Processes.

This department is designed to present from month to month a brief mention of new machinery, devices, and processes being brought out in this country and abroad, that are of interest to textile manufacturers. It is not a list of patents, but of improvements coming on the market. The idea being to present to our readers a systematic monthly record of new machinery, etc., of interest to textile mill men.
We invite machine builders and others to send us such information for this department.

Non-Fluid Oils. The New York & New Jersey Lubricant Company, 14 Church St., New York, have originated a process of making lubricating oils non-fluid and are putting these non-fluid oils on the market. The advantages claimed are that they run on the bearings until entirely consumed without drip or waste, thus requiring much less time spent in oiling and reducing cost of lubrication.

Automatic Knitting Machine for Hosiery. The Keystone Knitting Machine Mfg. Co., 2600 North Sixth St., Philadelphia, are bringing out a full automatic knitter for hosiery, in which simplicity and ease of operation have been carefully studied. It can be used with two cylinders or transfer points, if desired, has a positive thread splice and all parts are interchangeable.

Loom Fork. The Clegg Weft Fork Co., Fall River, Mass., are placing on the market a loom fork embodying several improvements which will commend themselves to manufacturers. A description of the device appears in another part of this issue.

Loom Fork. The Non-Rebounding Loom Fork Co., Fall River, Mass., are placing on the market an improved loom fork with several improved features which are described in another part of this issue.

Thread Guide. J. W. Cooke & Co., 18 Exchange St., Manchester, England, have recently brought out an improved thread guide and snarl catcher for ring frames and twisters. A hinged, notched shank falls against the lappet board when the latter is raised for doffing and resumes a vertical hanging position when the board is again lowered.

Heilmann Comb. The Elsassischen Maschinenbau-Gesellschaft, Mulhause, Germany, have made an improvement in their Heilmann comb. It consists of a new method of operating the top comb so that it may be brought closer to the cylinder than has heretofore been possible when the speed of the machine is increased.

Yarn Winder. Joh. Jacob Rieter & Cie., Winterthur, Germany. An improved machine for winding from skeins to spools. The number of spools has been increased and each spool is driven by a drum that can be stopped or started independently of the others. An ingenious device enables a "cross" or 'closed" wind to be obtained as desired. With the "closed" wind the yarn is wound spirally on the spool, resting at each turn against the yarn wound by the preceding turn.

Automatic Loom. James Cowburn, Monton, near Manchester, England, has brought out a self-shuttling loom the construction of which is too complicated for a description in this department. Like all the automatic looms now being offered to the English trade it changes its shuttle instead of the bobbin.

Beamer. Pemberton & Co., Burnley, Eng., loom builders, have extended their business to include the building of winding and warping machinery. A new beamer has recently been placed on the market. Although differing but slightly from the usual construction, it embodies many minor improvements which increase the product and contribute to perfect work.

Skein Leaser. Max J. Nordmann, Dresden, Germany. This is an attachment for a reeling machine. It automatically leases the skeins and ties the lease yarn at each skein. The device has recently been introduced into the shops of Platt Bros. & Co., Oldham, Eng. The inventor has recently patented a device for tying to the lease band the end of the yarn being reeled.

Electric Bleaching Apparatus. Paul Schoop, Muenchen, Germany, has designed and is offering to the trade an improved apparatus for bleaching textile materials by electrolysis. The improvements consist in modifications of the mechanical construction of the apparatus and are too extensive and complicated to be described in this notice.

Warp Sizing Apparatus. John Tattersall, Enschede, Holland, is placing on the market an improved device for sizing warp yarn on the slasher. The improvements consist in the use of a roll whose surface speed is greater than that of the yarn. It is claimed that the action of this roll lays the fibres of the thread in one direction and gives much better results when the cloth reaches the loom.

Rotary Cloth Press. Die Rhenische Webstuhlfabrik in Dulken is putting on the market a cloth press which it is claimed embodies many improvements over the present forms of this machine. The advantages claimed are high pressure, easy adjustment, facilities for relieving the pressure quickly and a high and uniform lustre on the goods.

Dynanometer. John Jacob Rieter & Co., Winterthur, Switzerland, has constructed a dynanometer especially adapted for measuring power consumed by textile machines.

Hank Brushing Machine. S. Spencer & Sons, Whitefield, England. An improved hank brushing machine which is said to obviate the difficulties experienced in stretching and brushing the yarn uniformly without breaking it; a difficulty especially likely to arise in cross-reeled yarns. Will brush or stretch any length of yarn; unequal stretching is prevented by working the two arms with a parallel motion.

Pirn Winder and Beaming Machine. George Hattersley & Sons, Keighley, England, have designed and are placing on the market two machines for preparing yarn for the loom. The first is a pirn winder for winding yarn from the skein, the second is a stop motion beaming machine for beaming yarn from short spools.

THE CRISS-CROSS CLEANER FOR BOILER TUBES.

The accompanying illustration shows an improved boiler tube cleaner called the "Criss-Cross," for which Newman Harrison, Clinton, Mass., is the sole selling agent in the United States. The cleaner is constructed so that it will not injure the flanges when entering the tube. A large number of independent, oblique, serrated cleaning edges come in contact with the surface of the tube at right angles, thus thoroughly removing all scale without injuring the tubes. The Criss-Cross cleaner can be easily adapted for

THE CRISS-CROSS CLEANER.

any size of tube. The cleaner is in the form of a double comb and is equally effective when moved in either direction. The cleaning cylinder is held between two end caps, and can be expanded or compressed to increase or diminish the diameter as desired. The cleaning cylinders are made of high carbon square steel wire, the resiliancy of which keeps them expanded with considerable force, and yet permits compression when they come in contact with a blister or other permanent obstruction in the tube. Another compensating attachment is found in the use of a spiral spring. The loosened scale is discharged from the tube when the cleaner is drawn in either direction. It is claimed that the Criss-Cross cleaner will polish new tubes and restore the surface of those that have become defaced by the use of chisel scraper, blowers, etc. Further information may be obtained upon application to the agent.

Ventilating Fan. Paul Uhlmann, Crimmitschau, Germany, is placing on the market a fan of new design which is said to be specially adapted for use in drying rooms and other parts of the mill where an effective circulation of air is desired without creating a strong draft.

A MODEL HEATING AND VENTILATING SYSTEM.

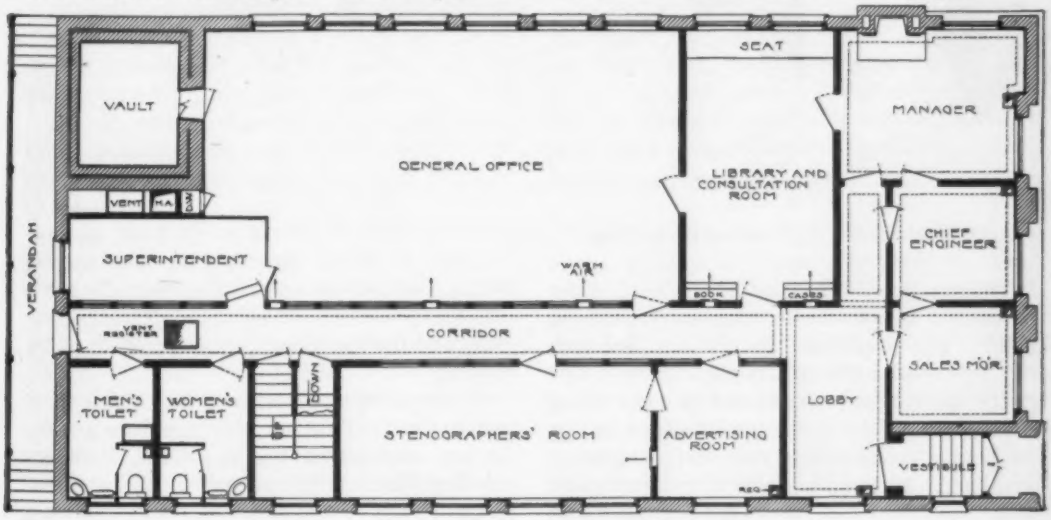
The accompanying plan shows the spacious new office building lately built by the American Blower Company of Detroit, Michigan.

THE AMERICAN BLOWER WORKS, DETROIT, MICH.

The business of this company has increased so rapidly during the last two years that the old offices, which occupied valuable space in one of the factory buildings, became entirely inadequate to accommodate the increased office force.

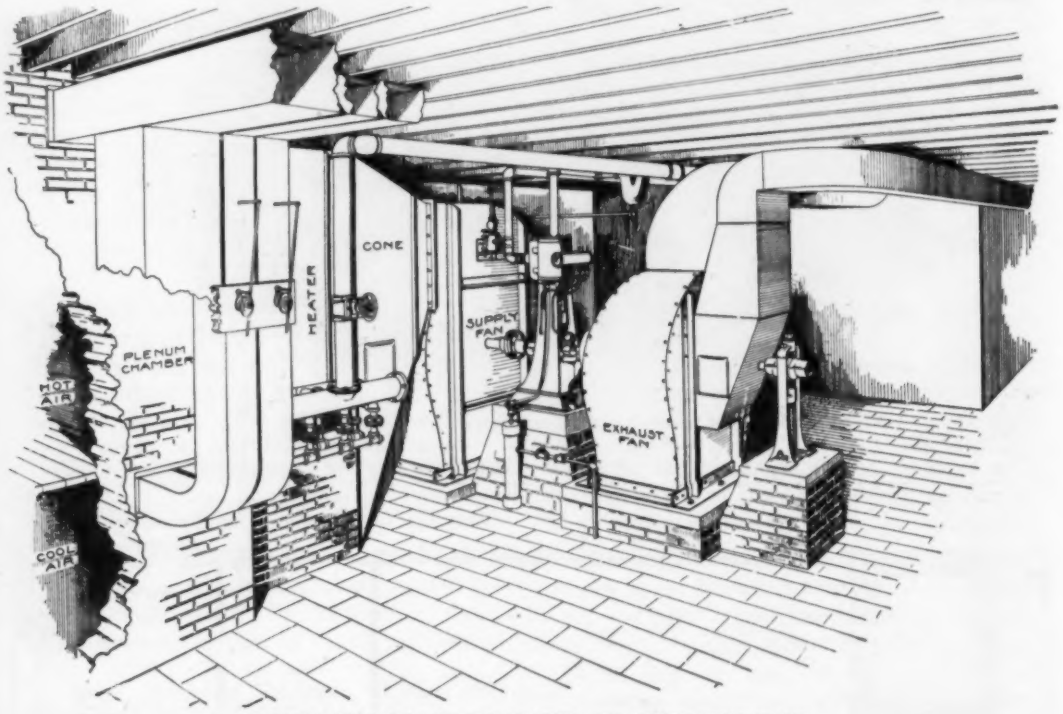
The building is equipped with every modern convenience, including electric lights, annunciator bells, dumb waiter, an outside telephone system and an independent inside, or house system, interconnecting all offices and different departments in the shop. A switch board for each of these systems is located in the lobby.

But the main interest in the equipment of this building is in the mechanical system of heating and ventilating. As the manufacture of heating and ventilating apparatus forms a



THE OFFICE PLAN OF THE AMERICAN BLOWER WORKS.

large part of the American Blower Company's business, this part of the office equipment naturally received close attention. This system represents the very latest and best practice in heating and ventilating. It has every possible advantage with none of the many disadvantages of direct steam or hot water radiation, by producing an even, pleasant temperature and perfect ventilation without drafts. In general the operation of the system is as follows:



SECTIONAL ELEVATION OF THE HEATING AND VENTILATING PLANT.

The apparatus is located at one side of the basement, as shown on the accompanying plan. The fresh air enters the building through the basement window and by means of the fan is drawn over a coil of pipes called the tempering coil. The steam pipes in this tempering coil are just sufficient in number and length to heat the volume of entering air to a temperature of 65 or 70 degrees Fahr. The fresh air is then drawn into the fan and forced over another heater, designed to heat the air to about 140 degrees. Beyond the heater is located a large brick chamber called the plenum chamber. This serves as a reservoir for the heated air and from this chamber the air is conveyed by galvanized iron pipes to the various offices. Under the main heater is a passage or by-pass as it is called, which permits a part of the air from the fan to pass under the main heater coil and into the plenum chamber. This passes into the lower section of the plenum chamber, which is separated from the upper part. Thus the plenum chamber is divided into two parts, as shown by the sectional elevation, the upper chamber containing hot air at approximately 140 degrees and the lower section tempered air at 70 degrees.

As shown by this sectional view, each individual pipe leading off to the offices above, has two connections to this plenum chamber, one branch to the upper section and another to the lower. In each main where the pipe divides into these two sections, there is located a set of double swinging dampers, or mixing dampers. Each set of these dampers is controlled automatically by a diaphragm

valve shown on the outside of the pipe in the sectional view. These automatic valves are part of a system of automatic heat control. These valves are operated by compressed air, which is supplied by a small air compressor, located in the basement. This compressor works by city water pressure and delivers air at about 15 pounds pressure.

The system of temperature regulation is as perfect in operation as it is simple in principle. In each office is located a thermostat which can be set to control the room temperature at any desired point. These thermostats work upon the principle of the unequal expansion and contraction of brass and steel. They are all connected by head pipes, of about 3/8 inch bore, with their respective diaphragm valves. On the expansion or contraction of a piece of brass and steel in the thermostat, air pressure is admitted or cut off from the diaphragm valve and the mixing dampers are swung one way or the other as the case may be. It will be noted that these mixing dampers in swinging do not cut off the flow of air, but simply vary the proportion of hot and tempered air as controlled by the thermostat to maintain a constant temperature in the room. Thus a constant flow of pure air of the proper temperature is maintained at all times. Under the tempering coil there is also a by-pass similar to the one under the main heater. This by-pass is fitted with a swinging damper which is controlled by a thermostat placed in the upper part of the plenum chamber. Thus if the air in the plenum chamber becomes too hot, the thermostat opens the damper under the tempering coil and allows the entering air to pass under the tempering coil, instead of through it. The air is admitted to each room at a point about eight feet above the floor.

As shown in the accompanying cut, the fan is operated by a direct connected vertical engine. This engine is also the American Blower Company's own make and is specially designed for this class of work. Another unique feature of this plant is the exhaust fan, which is direct coupled to the same engine which runs the heating fan and which draws the impure or vitiated air out of the building. Thus while one fan is discharging pure warm air into the building, the other fan on the same shaft is drawing out the impure air. This is the main feature of mechanical ventilation which has brought it into such general favor during the last few years for use in public buildings.

In each office on the first floor there is located an ornamental register face at the floor line, opening into the corridor which extends through the centre of office. The air is thence drawn down through the large register in the floor at the rear of the corridor and after passing through the exhaust fan is forced outside the building. The air from the drawing room and second story offices is drawn down through the flue at side of vault.

The condensation from the heating apparatus is returned to a feed-water heater located in the engine room of the factory, by means of the vacuum system. This same system handles all the condensation from two other heating plants located in the factory. The advantage of this vacuum system is that it eliminates the back pressure from the factory engine, when using exhaust steam for heating and also removes the air from the heating coils and connecting pipes as fast as it accumulates, thus making the heating surface far more effective than it otherwise would be.

Only one thing remains to be mentioned and that is the economy of this system. As the heating coils utilize the exhaust steam from the factory engine, which is brought into the basement through an underground conduct, and as the fan engine exhaust is also turned into the heater coil, the cost of operating the system is practically nothing, as only that which would otherwise be wasted is used, and without back pressure.

Brushing Machine for Plush and Velvet. Franz Mueller of Muenchen-Gladbach, Germany, is putting on the market an improved brush for cut plush and velvet. The brush slats are attached at intervals on an endless belt running in a horizontal direction. The plush is brought in contact with this brush by means of suitably arranged drums so that the brush is in contact with the cloth except when passing around the carrier pulleys at each side of the machine. A greatly increased production is claimed as compared with the ordinary upright belt brushes.

NON-REBOUNDING LOOM FORK.

One of the chief difficulties with the ordinary type of loom fork is its constant rebounding. A recent invention, patented last year, aims to overcome this difficulty. It will be noted from the illustration that there is an extension at the back of the fork which prevents rebounding as in the ordinary fork.

This fork is very easily adjusted and cared for and its special features tend to increase the production of the loom and save labor. It is manufactured by the Non-rebounding Loom Fork Co., of Fall River, Mass., and patents were granted February 4, 1902. They are in extensive use in mills in Fall River and vicinity and a sample fork and further information may be had from the manufacturers.

THE ENTWISTLE CARD GRINDERS.

The illustrations show the long roll and the traverse wheel grinders such as are built by the T. C. Entwistle Company, Lowell, Mass.

The long roll grinders are used for grinding revolving flats on all cotton cards. We understand that this company is the only builder in America of this type of grinder, and have made constant progress in this specialty.

THE ENTWISTLE LONG ROLL GRINDER.

THE ENTWISTLE TRAVERSE WHEEL GRINDER.

These grinders are made of seamless drawn tubing, with hardened and ground bearings. Special tools, of their own design, enable them to adjust the balance of these grinders so that there is no vibration whatever when running at a speed of 2,000 revolutions. The bearings and balance of a grinder are two of the most important features, and on these points they lay special stress and guarantee that their work in this particular is equal to any.

Besides the long roll grinder, they build a traverse wheel grinder for cotton, woolen and worsted cards with the same high standard of workmanship. With the traverse wheel grinder they furnish a differential motion, if desired, which is simple and compact in construction and noiseless in operation.

They make a specialty of repairing grinders of all kinds, and being fitted for this work can handle it satisfactorily, promptly and at as low a price as is consistent with good work.

They have recently issued an attractive circular of their grinder business, which is constantly growing. Over 4,000 Entwistle grinders are now in use in the mills in this country.

The attention that they are paying to their grinder department does not detract from their other specialties, viz., beaming and warping machinery, dye tub machines, expansion combs, etc.

MECHANICAL AND ELECTRICAL EQUIPMENT OF A COTTON MILL.

The mechanical and electrical equipment of the cotton mills of the Davis Mill Co., at Fall River, Mass., is in many ways exceptionally up-to-date, including a fan-and-heater system of heating and ventilation, induced-draft in place of a chimney and electrical motor-drive throughout. To provide flexibility in the

boiler plant and insure against shut-down, the induced-draft plant has been installed in duplicate. Two seven-foot blast-wheels, running in three-quarter, steel-plate housings, are driven by centre-crank, horizontal engines. The fan wheels are overhung in the housings and are furnished with special, wide, water-cooled bearings. The engines themselves are provided with extended shafts upon which a pulley is mounted between each fan bearing the respective engines. These pulleys are in reality the flanges of the couplings of the two parts of the shafts, the belts running directly on the flanges. They are used for driving the economizer scrapers.

The air connection between the fans contains a flat swinging damper, which is so arranged that either fan can be shut off and the other run separately if desired. The outlet connections are likewise provided with dampers and the operating attachments are so placed that both can be changed at once by hand. The engines receive steam at 80 lbs., and are furnished with a balanced valve which can be used in connection with a damper regulator.

The heating plant of the Davis Mills is a duplicate of that installed at the Arkwright Mills some years ago. It consists of a large exhaust wheel drawing air through a steam-pipe heater. The fan-wheel is provided with one tight and two loose pulleys and the engine has an extra wide, flat-face, fly-wheel for shifting the belt. A second belt connects the fan pulleys with the line-shafting of the mill. This arrangement makes it possible in the summer time to run the fan from the line shaft, thus taking advantage of the economy of the large mill engine, while in the winter, when the exhaust of the fan engine can be utilized in the heater, or at night when the large engine is not running, the fan is driven by the fan engine.

The heater is built up of 1 inch pipe erected on cast-iron sections which rest at one end on ball bearings to allow for expansion and contraction. It is so arranged that the exhaust steam from the engine can be used entirely in one group of sections, making it possible to condense all the exhaust before it is necessary to use any direct steam, which is added at a reduced pressure when necessary. The outfit also includes a Kendall receiving tank, with a water-gauge and a safety-valve, and a duplex Worthington steam-pump. The heating apparatus will heat the mill to 70 degrees F. when the temperature outdoors is zero.

The electrical equipment consists of two belted direct-current generators, one of 50 K. W. and one of 75 K. W., operating at 125 volts, no load, and compound-wound. These generators supply current for lighting and for a 27 H. P. motor and one of 43 H. P. The oiling devices of the motors are so arranged that they can be hung from the ceiling. The above apparatus has been furnished by the B. F. Sturtevant Co., of Boston, who also designed and constructed the heating and ventilating and mechanical draft plants.

THE CLEGG WEFT FORK.

The illustration shows the new Clegg loom fork, for which patent has recently been applied. This loom fork has several features of merit which commend it to the attention of manufacturers.

In the first place, the fingers are made of the best steel wire, carefully finished so as not

THE CLEGG LOOM FORK.

to chafe the yarn. They are held in a solid socket and riveted in so that they cannot turn, become loose or come out. The fork is carefully balanced. After being made, the entire fork is dipped in a solution of lead, which gives it the properties of that metal and is claimed to prevent rebounding. Special attention has been given to the shape of the fingers and the angle and elbow at which they are bent.

This new loom fork is being manufactured by the Clegg Weft Fork Co., 85 North Main St., Fall River, Mass. It is already in use in a number of Fall River mills, which speak very highly of it. A sample will be sent upon application from interested parties.

Dyeing, Bleaching, Printing, Etc.

A FAST FAST-BLACK.

The hosiery industry in this country is to have the benefit of a remarkable new process for producing black upon stockings. This is the invention of Mr. Charles E. Wild of Lansdowne, Pa., who says of it that it is not an improvement upon old processes, but is a new process, producing results which have never been obtained by the methods ordinarily practiced.

Mr. Wild was for many years connected with the Eddystone Manufacturing Company of Chester, Pa., a concern that has a world-wide reputation for its black goods. Mr. Wild subsequently spent a long time in Germany inspecting the processes employed there for producing hosiery blacks and after much experiment and consideration he devised the system which he now presents to the American knitting trade. It is not at all an experimental process; the system has been introduced in several of the largest knitting mills in the United States and is now in successful operation here.

The claims made for it by Mr. Wild are of a remarkable character and an inspection of the goods that have been treated by him certainly appears to sustain them. He guarantees a thorough oxidization, the fibre being dyed, not simply on the surface, but absolutely through and through, thus insuring permanency of color after hard wear. He guarantees also a deep shade of brilliant blue-black, an average natural gain of 10 per cent., a cold process insuring maximum strength and softness; and that the goods will be fast to wear, exposure, light and perspiration, acid, etc.; that they will be stainless, with no crocking, and that they will be free from lint and from bleeding and will be wash-proof.

Mr. Wild is a scientific man with a life-time's experience in dealing with blacks and although the claims he makes for the process are very strong indeed (as will be noted in his advertisement on another page), we are told that experience has justified his actual ability to make good all the guarantees given. Mr. Wild is an expert in black dyeing and is constantly consulted by dyers who have trouble in getting results.

The process is not a cheap one in its first cost, but on the principle that a good thing is cheaper in the long run than an inferior one, there is reason for believing that Mr. Wild's process will commend itself to manufacturers who aim to produce high grade goods. Mr. Wild may be addressed at Lansdowne, Pa.

THE ASSAY OF TANNIN MATERIALS.

Tannins containing substances used by the cotton and silk dyer are not many but their manufacture and consumption is considerable. Notwithstanding the great number of direct dyes now in use requiring no tannin or other mordants, there are a very large number of shades constantly dyed that can only be secured by means of mordants on the one hand and basic colors on the other. Many attempts have been made to modify the shades obtained by means of the direct dyes by topping, etc., with a view of brightening them, but up to the present time the results obtained have not been satisfactory.

Nearly all the tannin substances used by cotton dyers for mordanting purposes may be included in the group of sumacs, either solid, liquid, or in the crude state, such as leaves, barks, etc. The two former, however, taking the lead on account of economy and convenience in use, the liquid extracts having the preference.

As a rule these products are sold upon their assay value and, other things being equal, the less colored the sample the higher will be the price. To judge properly the value of a given sample of extract, it should not only be assayed for actual content of tannin but it should also be examined as to its "staining" qualities, for it stands to reason that the less color it has the brighter will be the resulting shades dyed upon it. In testing a sample of

sumac or other similar extract no attention should ever be paid to the readings of a hydrometer or "Twaddle," as in no instance will the instrument indicate the quantity of tannin contained in the sample. This may be contrary to the common practice of many dyers who have implicit faith in this method of "testing," but it is not in accordance with the teachings of sound business. To suggest a proper method for the general use of dyers is not possible because the tendency at this time is towards uniformity of methods and it would be only confusing to have a method for dyes, another for tannins, etc. Consequently a process of general application adapted to all classes of consumers and used alike by the maker, seller and buyer will, on the whole, be the proper one to use. Such a method is here given and it should be adopted by all concerned and likewise be embodied in all contracts so that the chance of dispute as to the value of a shipment would be reduced to a minimum. Many disputes in the past have arisen wholly from the absence of just such a standard method for assaying. The method given is one adopted by the Department of Agriculture and is known as the Official Method for the Analysis of Tannin Materials.

I.—PREPARATION OF THE SAMPLE.

Barks, dry extracts, etc., are ground to such a degree of fineness as to admit of thorough extraction. Liquid extracts are heated to 50° C. (122° F.), well shaken and allowed to cool to room temperature.

II.—QUANTITY OF MATERIAL.

In case of barks, etc., use such quantity as will give about 0.35 to 0.45 gram tannin per 100 c. c. of solution, extract in a soxhlet or similar apparatus at steam heat for non-starchy materials. For canaigre and substances containing like amounts of starch use temperature of 50° to 55° C. until near complete extraction, finishing the operation at steam heat. In case of extract, weigh such quantity as will give 0.35 to 0.45 gram tannins per 100 c. c. of solution, dissolve in 900 c. c. water at 80° C., let stand 12 hours and make up to 1 litre.

III.—MOISTURE.

A. Place 2 grams if it be an extract in a flat bottomed dish not less than 6 cm. in diameter, add 25 c. c. water, warm slowly till dissolved, continue evaporation, and dry.

B. All dryings called for, after evaporation to dryness on water bath or others, to be done by one of the following methods, the soluble solids and non-tannins being dried under similar and, as far as possible, identical conditions:

1. For 8 hours at the temperature of boiling water in a steam bath.
2. For 6 hours at 100° C., in an air bath.
3. To constant weight in vacuo at 70° C.

IV.—TOTAL SOLIDS.

Shade the solution and without filtering, withdraw 100 c. c., evaporate in a weighed dish and dry to constant weight at the temperature of boiling water.

V.—SOLUBLE SOLIDS.

Double pleated filters, 15 cm. in diameter to be used. To 2 grams Kaolin add 75 c. c. of the solution, stir, let stand 1/4 hour, and decant as much as possible. Add 75 c. c. more of the solution, pour on the filter which must be kept full, reject the first 150 c. c. of the filtrater, evaporate the next 100 c. c. and dry. Loss during filtration to be guarded against.

VI.—NON-TANNINS.

Prepare 20 grams hide powder by digesting 24 hours with 500 c. c. water and adding 0.6 gram chrome alum in solution. This solution to be added as follows: One half at the beginning and the other half at least 6 hours before the end of the digestion. Wash by squeezing through linen, continue the washing until the wash water does not give a precipitate with chloride of barium. Squeeze thoroughly by hand, remove as much water as possible by means of a press, weigh the pressed hide, and take approximately 1/4 of it for moisture determination. Weigh this fourth carefully and dry to constant weight. Weigh the remaining three-quarters carefully and add them to 200 c. c. of the original solution; shake 10 minutes, and squeeze the

tanned hide through linen. Collect this filtrate, add five grams Kaolin, free from soluble salts, stir well and filter through a folded filter (15 cm. diam.), returning the first 25 c. c. Evaporate 100 c. c. of the clear filtrate. The weight of this residue must be corrected for the dilution caused by the water contained in the pressed hide powder.

VII.—PROVISIONAL METHOD.

To 14 grams of dry chromed hide powder in a shaker glass add 200 c. c. of the tannin solution; let stand 2 hours stirring frequently, shake 15 minutes, throw on funnel with a cotton plug in the stem, let drain, tamp down the hide powder in the funnel, return the filtrate until clear and evaporate 100 c. c.

VIII.—TANNINS.

The amount of these is shown by the difference between the soluble solids and the corrected non-tannins.

The amplified method provides for the testing of the hide powder and also of the filtrates, details that are generally well known.

The results of such an assay will show as follows:

Moisture,
Soluble Solids,
Insoluble Solids,
Tannins,
Non-Tannins.

From the dyer's point of view this assay must be supplemented by a test showing the staining qualities of the sample. This is done by taking a skein of bleached cotton yarn and immersing it in a definite quantity of the tannin solution for 6 hours, removing therefrom, squeezing without washing, then drying and comparing with an untreated skein.

The writer's practice is to treat double skeins with such a quantity of tannin substance as is equal to 5 per cent. of "tannic acid" on the weight of the cotton. Enter at 90° C., and allow to cool to about 15°, lift, squeeze, and pass one skein through a solution of tartar emetic and then dry. This shows the staining qualities of an extract and also the influence of antimony, which frequently shows results that will impair the usefulness of a given extract for many purposes.

DYEING LINEN WITH PRIMULINE.

This dyestuff has been used for the production of a large number of shades upon almost all fibres but it is of special interest for the dyeing of yellows upon linen. Bleached linen always yields the very best results but attention should be given to the bleaching process used so that the maximum brilliancy or lustre of the fibres will be brought out and also that they shall not be weakened or tendered in any way.

When ordinary full shades are desired the dyebath may be made up with

2 to 2½ per cent. Primuline,
25 per cent. Common Salt,

and dyeing at the boil. The yarn is dyed quite evenly and the shade obtained is of a peculiarly pleasing greenish tone which is not, however, remarkable for its general fastness, being materially altered by light, alkalies, acids, etc.

A curious mode of aftertreating direct dyed Primuline is as follows: Dye as above described and then pass the yarn through an ordinary diazotizing bath prepared with

2½ per cent. Nitrite of Soda.
7½ per cent. Hydrochloric Acid.

Immersion in this bath lasts for 15 to 20 minutes when it is lifted, washed well in cold water and immediately worked in a fresh bath made up with

5 per cent. Ammonia Water 21° Be,

and heated to about 95° F. Here the yarn is regularly turned for 20 to 30 minutes after which it is lifted, washed and dried, yielding a yellow that is very fast to ordinary washing and soaping and resists exposure to light very well.

Another method of treating a direct dyed Primuline is to work the yarn for an hour in a bath heated to 100° F., and containing about ten per cent. of bleaching liquor (Sodium Hypochlorite standing at 10° Tw). At the completion of this treatment, lift, wash well so as to remove all traces of chlorine, and dry. The resulting shade is remarkably fast to all ordinary influences, it being not appreciably affected by air, light, moisture,

acids or alkalies. The shade obtained from about 2 to 2 1/2 per cent. of Primuline and treated as described will be a full gold yellow.

THE USE AND ABUSE OF THE SULPHUR COLORS.

Much has been written and without doubt more will be written, regarding the subject of sulphur colors with a view to make clear to many dyers some of the essential precautions that must be given attention in order to secure the best results in dyeing. There are many dyers who, in the early days having experimented with sulphur colors and failed to obtain even passable results, are likely to regard that past experience as meeting the present requirements, when experimenting with the new, and certainly very much improved colors of the present day.

We are very safe in asserting that even today our highest types of sulphur colors are far from being perfect dyes, but every few months newer products are given to the public that have properties not possessed by their predecessors.

In general the following notes are important to secure the maximum efficiency of the average sulphur color.

DISSOLVING.

Hot water should be poured upon the dyestuff, and not, as is usually done, put the dye into the dye vat. If the dye is one that requires sulphide of sodium for solution, a portion of this substance should be dissolved in the boiling water before pouring over the color.

Wooden tubs only should be used for dissolving. Metals—especially such as easily form sulphides—should be absent. Iron tanks can be used to advantage and, where sulphur colors are used in large quantity, an iron vat fitted with steam pipes will be found very useful and economical. The draw-off should be about 3 inches above the bottom to keep back sediment.

USE OF SODIUM SULPHIDE.

In dyeing with the sulphur colors the presence of sodium sulphide is necessary in order to keep the color in solution, and a sufficient quantity must be present to keep the dye solution quite clear; a slight excess of sulphide is not injurious to the dyeing, but a large excess prevents proper dyeing of the cotton by its strong solvent action on the color.

If, on the other hand, an insufficient quantity is present the dye bath will not be clear, the resulting dyeing will be thin, and crocking will be noticed in spite of the best washing.

The proper test for the correct quantity of sodium sulphide is to place a drop of the dye liquor on a piece of white blotting paper and observe any precipitate, which will be apparent if present.

If the bath is subject to prolonged boiling the sulphide gradually oxidizes, forming sulphuric acid, which instantaneously decomposes an equivalent amount of sulphide, thus setting free some sulphur in an insoluble form (of which we will write further). To obviate this, it is necessary to have in the bath a certain amount of soda ash or caustic soda, which neutralizes the sulphuric acid as soon as formed and keeps the bath always alkaline, an absolutely necessary condition.

The formulas as published by the different dyestuff makers vary in a few particulars, but they are essentially the same in principle, and in every instance they may be slightly modified by the dyer to meet the conditions of each dyeing. Like logwood and indigo, the sulphur dyes may be "humored," but only when intelligently done, and with a full and accurate knowledge of the particular dye and the nature of the substances used in the bath.

THE USE OF SALT.

Common salt or Glauber's salt is a necessary addition to the dye bath, and its object is to promote the taking-up of the color by the cotton at the dyeing temperature. As in the dyeing of the direct colors its proportion is dependent upon the depth of shade desired, except that in every case it is present short of saturation. It is a great mistake to suppose that an excess of salt promotes level dyeing; such a result can be secured only by manipulation of the material to be dyed and in no other way.

Penetration of heavy goods is not benefited by too much salt, but as full shades are not to be obtained unless salt in fair quantity is

present, recourse must be had to other substances such as starch or dextrine, or Turkey-red oil, either of which aid the dye liquor to penetrate the closest woven tissues.

Turkey-red oil, however, in the presence of salt or Glauber's salt is decomposed to some extent, and a curd-like substance floats upon the bath. This is an objection, as it is only removed from the fabric after dyeing with difficulty.

No substance used in dyeing with the sulphur colors is of itself injurious to cottons, and when used in the proportions usually indicated. The only injurious effects that are noticed are when the dyed material has not been thoroughly washed after dyeing. Practically all sulphur colors require about the same volume of water to ensure permanent results, and one thing is certain, founded upon good sense and experience of many dyes, that he who washes his goods the most has the fewest complaints.

Sodium sulphide, when decomposed, by an acid, yields a fine deposit of free sulphur, and when this occurs in the dyebath, this fine deposit becomes fixed within the folds and twists of the yarn, and cannot be completely removed by either washing or other means, hence the absolute necessity of keeping the dye bath alkaline—not neutral—but alkaline to a certainty. It is immaterial whether soda ash or caustic soda be used for this purpose, so as to prevent the formation of free sulphur in the bath.

Suppose, on the other hand, the bath was alkaline, and the dyeing was to be "fixed" with a metallic salt in an acid solution. If the dyeing, before fixing, was not thoroughly washed so as to remove all traces of soluble sulphide from the fabric, they will also suffer decomposition, and free sulphur will again be deposited, but in the fixing bath, and washing will be equally ineffective.

Should the processes be perfect, even including the "fixing," but imperfectly washed thereafter, danger still lurks in the traces of free acid remaining which will surely manifest itself at some time after the goods are manufactured.

It is certain that no class of dyestuffs are sure to play a greater part in the manufacture of textiles than the sulphur colors, and it is equally certain that their general mode of application to textiles will not vary much from the present, so that the remarks made in the present paper about injurious results will hold good.

The question of dyeing fabrics with sulphur colors resolves itself into two very simple considerations: first, that the bath be alkaline, and second, thorough washing after each operation.

SODIUM CARBONATE AND CAUSTIC SODA.

The carbonated alkalies that are made use of by dyers and scourers are few in number and consist chiefly of pearl ash or carbonate of potash on the one hand, and soda ash, sal-soda, and concentrated sal-soda on the other. It is these latter three products that will receive notice here on account of the wide difference in strength between each of them, and the lone manner in which one is substituted for another.

In buying and selling alkali of any kind it is always billed as being of some definite per cent.; for instance, soda ash may be "caustic" or "carbonated" and may be 48, 52, 56 or 58 per cent. in strength, each per cent. being designated a "degree," and marked with a ° sign. Each "degree" or per cent. represents the active quantity of oxide of sodium (Na_2O) and is the substance that determines the commercial value of any given sample upon assay.

Caustic ash, above referred to, is a grade of soda ash containing a variable proportion of caustic soda, which renders the product quite unsuited for many purposes, although quite desirable on account of its sharpness, for a number of others.

Pure soda ash is usually from 98 to 99 per cent. pure sodium carbonate, the impurities generally consisting of traces of various unavoidable substances that cannot be removed by the ordinary process of manufacture. Such "pure" soda ash will assay 58 per cent. or slightly over this amount, and the apparent discrepancy between 58 per cent. assay strength and 99 per cent. purity is explained in the following manner, making use of the chemical atomic weights.

Soda ash is Sodium Carbonate = Na_2CO_3

Na=23 C=12 O=16

Na_2 = 23x2 =46

C=12 =12

O_3=16x3 =48

Molecular weight of Na_2CO_3 = 106=100% pure

Oxide of Sodium=Na_2O=62

106 : 62 :: 100 : x = 58.48 per cent., representing the maximum amount of Na_2O that any sample of pure (even chemically pure) soda ash can contain, consequently a sample that assays say, 57.9 per cent. Na_2O is to be regarded as being 99 per cent. pure and would be so reported.

The relative strength of the three sodium carbonates mentioned are as follows:

Soda Ash,	Na_2CO_3	= 58.5 % Na_2O
Conctrtd. Sal Soda,	$Na_2CO_3.H_2O$	= 50.0 % Na_2O
Sal Soda,	$Na_2CO_3\ 10H_2O$	= 21.68% Na_2O

From the above figures it will be seen that these three common types of alkali have very different degrees of strength and that it is necessary when substituting one for the other, to observe the relative amount of alkali contained in each. On the ounce basis the following figures are correct, of course disregarding small fractions.

16 ozs. soda ash equals 18 3/4 ozs. concentrated sal soda; 16 ozs. soda ash equals 43 1/4 ozs. sal soda; or, 100 pounds soda ash equals 117 pounds concentrated sal soda, or 270 pounds ordinary sal soda.

The commercial caustic sodas range in "degree strength" from 48, 60, 70, 74, 76 and 77 per cent., each per cent. or degree representing a unit of Na_2O. Caustic soda or sodium hydroxide is different from sodium oxide, in that it is the hydroxyl of sodium, this Na OH. containing only one chemical equivalent sodium, while the oxide contains two equivalents, thus: Na_2O, so that in making assays and calculating the unit value of caustic soda, two molecules (twice Na OH or 40 × 2 = 80) must be taken.

Assays are made with a normal or decinormal solution of sulphuric acid. One litre of the former contains 49 grams of real acid, or 0.049 grams per cubic centimetre. This is of importance for if a quantity of soda ash, for instance, 5.3 grams, is dissolved in water and exactly neutralized with a normal solution of acid in the presence of an indicator, such as methyl orange, and the amount of acid consumed is 100 cubic centimetres, the soda ash is 100 per cent. in strength of carbonate and equal to 58.5 per cent. ash. Consequently, using 5.3 grams as the standard quantity for test, the actual number of c.c.'s of acid exactly represents the true strength of the sample, and this multiplied by .585 gives the commercial value. The same process of calculation would be followed for all the other alkalies, using the standard quantities as indicated below:

Sodium Oxide	Na_2O	3.1 grams
Sodium Hydrate (caustic)	Na OH	4.0 "
Sodium Carbonate (ash)	Na_2CO_3	5.3 "
Soda Crystals (Sal Soda)	$Na_2CO_3 10H_2O$	14.3 "
Conctd. Sal Soda	$Na_2CO_3H_2O$	6.2 "

WETTING-OUT COTTON PREPARATORY TO DYEING.

Under various names, certain products, being none other than single oils or mixtures of oils treated with concentrated sulphuric acid and exactly neutralized or made strongly alkaline with ammonia, are sold for the purpose of dissolving from cotton the natural oils and waxes found thereon, which act as a preventive to level dyeing, etc.

Justin-Muller has found by experiments covering a long period, that ordinary soap meets every requirement, and at a considerably lower cost, the money value of the two products taken into consideration. He has found that palm-oil soap is superior in efficiency to olive-oil or castor-oil soap, but both of these being superior to any sulphated oil.

Like any other soap solution they should not be used in hard water.

If a good quality of mill soap is dissolved to a clear solution, given a distinct ammoniacal odor with ammonia water, and used in the proportion of about one quart to 150 lbs. of cotton, good results in wetting-out will be secured.

On a single filament of merino wool as many as 2,400 barbed scales have been counted in the space of an inch. On Saxony wool there are as many as 2,700, while other wools fall as low as 1,860.

New Color Cards.

Immedial Cutch; Cassella Color Company, 182 Front St., New York City.

Eight samples of yarn, four of cloth, and four of raw cotton dyed with Immedial Cutch O and G.

Montana Brown; C. Bischoff & Co., 88 Park Place, New York City.

Three samples of raw cotton, three of cotton yarn, and two of cotton cloth dyed various shades of brown with Montana Brown 3G and M.

Direct Brown N; C. Bischoff & Co., 88 Park Place, New York City.

Two samples of raw cotton, two of cotton yarn, one of cotton cloth, one of woolen cloth and two of half silk cloths dyed with Direct Brown N.

Silk Scarlets; Read, Holliday & Sons., Ltd., 7 Platt St., New York City.

This card shows two samples of silk yarn, two of woolen cloth and two of woolen yarn dyed with Silk Scarlets T and T B. Although called Silk Scarlet it is well suited for dyeing wool as is shown by the samples on the card.

X L Yellow; Read, Holliday & Sons., Ltd., 7 Platt St., New York City.

Six samples dyed with X L Yellow on silk, woolen, jute and straw.

Bleaching Cotton Yarn.

Editor Textile World Record:

Please give me some detailed information regarding the best method of bleaching cotton yarn. Of what strength should the chemic be? What is the best way to avoid streaks? Is the circulating process the best?

Cherry Tree (338).

A practical bleacher to whom this question was referred writes as follows: "The strength of the chemic depends on the quality of the yarn. For yarn from 100's to 10's the strength should be from 1/4° to 1° Tw. scale; the finer the yarn the lower the strength. The sour should be double the strength of the chemic, that is, 1/4° chemic for 1/2° sour or 1/2° chemic for 1° sour and so on. As to streaks a thoroughly good treatment in the boiling kier would prevent any irregularity. The circulating system is all right where a large quantity of yarn is to be treated, but I would consider that it involves an altogether too large expenditure of capital to instal the plant for bleaching in a small way."

Pennsylvania, Philadelphia. The Peerless Silk Dye Works, 1845 Willard Street, Philadelphia, is to be known in the future as the Peerless Company. The capital is $50,000. The following parties will be connected with the new company: Henry Brewin, John L. Landenburg, S. S. Humphreys and Charles Eicholz.

DYE RECIPES.

The following recipes appear in the Dyers' Supplement, which is issued each month by the TEXTILE WORLD RECORD. The Supplement contains the colored samples, dyed according to recipes given. The selection of samples is carefully made, and it is the aim to show shades which are of especial interest to the dyer, and which the requirements of the market demand. The Dyers' Supplement is a 16-page pamphlet, in convenient form for preservation. Subscription price for the Dyers' Supplement $1.00 per year.

Recipe No. 113.

Blue on Cotton Yarn.

Dianol Blue G on 100 lbs. cotton yarn. Prepare dye bath with

3 lbs. Dianol Blue G.
(Thos. Leyland & Co., 53 India St., Boston.)
20 lbs. Common Salt.

Enter yarn at 180° F. and dye at a boil for one hour.

Dianol Blue G gives a bright, full shade of blue, dissolves easily and dyes level.

Recipe No. 114.

Brown on Cotton Yarn.

Tetrazo Sulphur Brown G on 100 lbs. cotton yarn. Prepare the dye bath with

10 lbs. Tetrazo Sulphur Brown G.
(New York and Boston Dyewood Co., 15 William St., New York.)
6 lbs. Sodium Sulphide.
2 lbs. Soda Ash.
50 lbs. Common Salt.

Dissolve dye stuff and sodium sulphide together and add to dye bath. Dye for one hour at or just below the boil, keeping the material below the surface of the dye bath as much as possible.

Tetrazo Sulphur Brown G produces an excellent and fast shade of brown.

Recipe No. 115.

Grey on Cotton Yarn.

Malta Grey B on 100 lbs. of cotton yarn. For the best results first mordant the yarn in a bath containing

4 lbs of Tannin.

Entering at 180° F. and allowing to steep ten to twelve hours, or over night in the gradually cooling bath.

Wring or hydro extract and without washing work for 20 minutes in a cold bath containing

4 lbs. Tartar Emetic.

Wash and then dye in a neutral bath containing

1 lb. Malta Grey B.
(Sykes & Street, 85 Water St., New York.)

Enter cold, work cold for 10 to 15 minutes, gradually bring to a boil and dye at a boil ½ hour.

Extra fastness may be secured by passing the dyed material first through a bath containing

5 lbs. Tannin

and then through one containing

5 lbs. Tartar Emetic.

Malta Grey B is remarkably fast to light and soap.

Recipe No. 116.

Carmine Red on Woolen Cloth.

Brilliant Carmine on 100 lbs. woolen cloth. Prepare the dye bath with

2 lbs. Brilliant Carmine.
(New York and Boston Dyewood Co., 156 William St., New York.)
4 lbs. Sulphuric Acid.
10 lbs. Glauber's Salt.

Enter at 100° F., bring to a boil and dye at a boiling temperature for one hour.

Brilliant Carmine is of especial interest for dyeing wool piece goods, as they dye level easily and are fast to light.

Recipe No. 117.

Green on Worsted Yarn.

Cyanole Green G Pat. on 100 lbs. worsted yarn. Prepare the dye bath with

3 lbs. Cyanole Green G Pat.
(Cassela Color Co., 182 Front St., New York.)
4 lbs. Sulphuric Acid.
10 lbs. Glauber's Salt.

Enter at 100° F., bring to a boil and dye at a boiling temperature for one hour.

Cyanole Green G Pat. is distinguished for its excellent fastness to alkalies, washing, light and storing, also to rubbing and carbonizing.

It does not tint white cotton, artificial silk, or China grass threads contained in woolen piece goods.

Recipe No. 118.

Black on Worsted Yarn.

Cashmere Black B on 100 lbs. worsted yarn. Prepare the dye bath with

6 lbs. Cashmere Black B.
(Farbenfabriken of Elberfeld Co., 40 Stone St., New York.)
10 lbs. Glauber's Salt.
15 lbs. Sodium Bisulphate.

Enter at 170° F., bring to a boil and dye at a boiling temperature for one hour.

Cashmere Black B produces an excellent shade, similar to logwood black. It dyes extremely level and its fastness is good.

Recipe No. 119.

X L Yellow on Silk.

X L Yellow on 100 lbs. of silk. Prepare the dye bath with

2 lbs. X L Yellow.
(Read, Holliday & Sons, Ltd., 7 Platt St., New York.)
10 lbs. Glauber's Salt.
2½ lbs. D. O. V.

Enter the goods lukewarm, raise to boil in half an hour, dye at the boil for half an hour.

X L Yellow is exceedingly fast to light and possesses excellent leveling and penetrating powers. powers.

Recipe No. 120.

Blue on Cotton Yarn.

Chlorazole Blue 6 G on 100 lbs. of cotton yarn. Prepare the dye bath with

2 lbs. Chlorazole Blue 6 G.
(Read, Holliday & Sons, Ltd., 7 Platt St., New York.)
10 lbs. Common Salt.

Enter yarn at 180° F., bring to a boil and dye at a boil for about one hour.

Chlorazole Blue 6 G produces an excellent shade blue and possesses all the characteristic properties of the direct cotton colors.

Recipe No. 121.

Dark Green on Worsted Yarn.

Alizarine Green B on 100 lbs. worsted yarn. Prepare the dye bath with

3 lbs. Alizarine Green B.
(Berlin Aniline Works, 213-215 Water St., New York.)

Enter yarn at 140° F., bring to a boil and dye at this temperature one-half hour, then add

3 lbs. Acetic Acid

and continue the boiling one and one-half hours longer.

When dyed in this way Alizarine Green B gives a dark shade of green, possessing excellent fastness to light and milling.

Recipe No. 122.

Blue on Cotton Yarn.

Chlorine Blue R on 100 lbs. cotton yarn. First mordant the yarn with tannin, by thoroughly working for one-half hour in a hot tannin bath containing

10 lbs. of Sumac

and then allowing it to steep several hours or better over night in a gradually cooling bath. Wring without washing, then work for one-half hour in a cold bath containing

2 lbs. Tartar Emetic.

Wash Thoroughly and then dye in a bath containing

1 lb. Chlorine Blue R.
(A. Klipstein & Co., 122 Pearl St., New York.)
½ lb. Acetic Acid.

Enter at 100° F. and dye for one hour at 160° to 170° F.

Chlorine Blue R is very fast to chlorine and boiling soap.

Recipe No. 123.

Blue on Cotton Yarn.

Pyrol Blue on 100 lbs. cotton yarn. Prepare the dye bath with

10 lbs. Pyrol Blue.
(C. Bischoff & Co., Park Pl., New York.)
40 lbs. Sodium Sulphide.
40 lbs. Glauber's Salt.

Enter at 150° F. and dye at or just below the boil for one hour, keeping below the surface of the dye liquor as much as possible.

After treat for one-half hour at 170° F. in a bath containing

1½ lbs. Potassium Di Chromate.
1½ lbs. Copper Sulphate.

Wash and dry.

Pyrol Blue gives a very fast shade.

Recipe No. 124.

Yellow on Worsted Yarn.

Fast Acid Yellow G on 100 lbs. worsted yarn. Prepare the dye bath with

1 lb. Fast Acid Yellow G.
(E. M. Thayer & Co., 106, 112 Broad St., Boston.)
10 lbs. Glauber's Salt.
3 lbs. Sulphuric Acid.

Enter yarn at 120° F., bring to a boil and finish within one hour.

Fast Acid Yellow G is a new dyestuff which is remarkably fast to light. It dyes very level and is not only valuable as a self color but is very useful for combinations.

Recipe No. 125.

Yellow on Worsted Yarn.

Fast Canary Yellow on 100 lbs. worsted yarn. Prepare the dye bath with

12 ozs. Fast Canary Yellow.
(H. S. Vila, 115 So. Second St., Philadelphia, Pa.)
10 lbs. Glauber's Salt.
4 lbs. Sulphuric Acid.

Enter at 170° F. and dye at a boil for one hour.

Fast Canary Yellow will be found very fast, especially to sunlight, and is an excellent combination color.

Recipe No. 126.

Brown on Worsted Yarn.

Acid Alizarine Brown T on 100 lbs worsted yarn. Prepare the dye bath with

4 lbs. Acid Alizarine Brown T.
(H. A. Metz & Co., 122 Hudson St., New York.)
10 lbs. Glauber's Salt.
3 lbs. Sulphuric Acid.

Enter yarn at 180° F., bring to a boil and dye at this temperature for one hour. Then add

3 lbs. Potassium Di Chromate

and boil one hour longer.

Acid Alizarine Brown T equalizes well, is as fast to rubbing as Alizarine Brown, and is excellently fast to alkalies, washing, milling and light.

Recipe No. 127.

Violet on Cotton Yarn.

Fast Direct Violet R on 100 lbs. cotton yarn. Prepare the dye bath with

2 lbs. Fast Direct Violet R.
(H. S. Vila, 115 So. Second St., Philadelphia.)
25 lbs. Common Salt.

Enter at 180 F., and dye at a boil for one hour.

Fast Direct Violet R is fast to sunlight and hot pressing and works well in combination with all direct colors.

Recipe No. 128.

Black on Cotton Yarn.

Pluto Black A Extra on 100 lbs. cotton yarn. Prepare the dye bath with

5 lbs. Pluto Black A Extra.
(Farbenfabriken of Elberfeld Co., 40 Stone St., New York.)
2 lbs. Soda Ash.
40 lbs. Glauber's Salt.

Enter yarn at 170° F., bring to a boil and dye at a boiling temperature for one hour.

Pluto Black A Extra produces a black with a blueish tone, possesses good coloring power, and is cheap.

It is very well adapted to the dyeing of union goods.

Mill News.

COTTON.

New Mills.

*Alabama, Huntsville. The new Merrimack Mill will begin to install machinery the latter part of August or in September, and will probably be ready for production by the first of the year, if not sooner.

Georgia, Columbus. It is reported that E. N. Clemence, treasurer of the Eagle and Phenix Mills, will be interested with others in erection of a $300,000 cotton mill for manufacturing colored goods.

*Georgia, Forsyth. Referring to the report of the organization of the Towaliga Cotton Mills Co., we are advised that no mill is contemplated at the present time. The Towaliga Falls Power Co. has been organized, and proposes to develop the water power at High Falls, in Munro County, and transmit same electrically to Griffin, Ga., which are the headquarters.

Georgia, Macon. Edward Wolff Cotton Waste & Linter Ca. has been incorporated with a capital stock of $50,000. Edward Wolff is the manager. The purpose of the company is the dealing in cotton waste, linters and bagging.

*Georgia, Lafayette. Contract for the building of the Lafayette Cotton Mills will be let before August 1st. It is expected to be ready for machinery in the spring.

*Georgia, Neal, Pike County. The Neal Cotton Mills and Power Co. has been organized with H. B. Neal, J. E. Knott, E. T. Whaley and others, incorporators. The project was mentioned last April and it now seems likely that the mill will be built.

*Louisiana, New Orleans. The Lane Mill advises us that its new building will contain about 25,000 spindles and 1,000 looms. It is somewhat larger than originally reported. They will make blue denims and colored goods. Much of the machinery has been arranged for.

*Louisiana, Shreveport. The Hargrove Cotton Mill project is still alive and the promoters claim that it is likely to materialize soon, if Georgia parties, with whom they are in correspondence, become interested. Andrew Currie has charge of the project at this end.

*Massachusetts, Fall River. The building contract for the new Luther Mill has been signed. C. H. Sears is the contractor, Saco & Pettee Shops have the carding, drawing and spinning, and Kilburn, Lincoln & Co. the looms. The present Robeson property will be remodeled, and a two-story granite weave shed erected. Fancy goods will be made.

*Massachusetts, New Bedford. The new mill at New Bedford will have no connection with the Whitman Mills, although the principal owners of the Whitman Mills will be largely interested. The product will be sold by Harding, Whitman & Co. The corporation has not as yet been formed, but will be at an early date, and probably under Massachusetts laws, with a paid-up cash capital of $800,000. The name of the company will doubtless be Manomet Mills. It will contain 52,000 spinning spindles, to make combed cotton yarns, and will cost $1,000,000. B. F. Smith has building contract and broke ground July 20. Expected to be roofed in by December.

*North Carolina, Bessemer City. Work has begun this month on construction of new buildings for the Whetstone Cotton Co., incorporated with capital stock of $100,000; S. J. Durham, president and treasurer and L. W. Buck, vice president and superintendent. They will make fine damask, operating 40 broad looms, using steam power. Goods will be sold through Brander-Walsh Co., New York.

*North Carolina, Charlotte. The equipment of the Hoskins Mill is likely to be 25,000 spindles and 600 looms, instead of 1,500 spindles and 450 looms, as originally reported.

North Carolina, Charlotte. The Hiss Manufacturing Company has been incorporated with capital stock of $500,000 and will erect a new mill at Rhodhiss, where those interested in the new concern have another cotton mill. The new plant will be equipped with 25,000 spindles and 800 looms for manufacturing a fine grade of cotton goods. Electricity will be motive power.

*North Carolina, Charlotte. Contracts for the new mill to be built by the Highland Park Mfg. Co. have been let. There will be two buildings. The additional machinery includes 30,000 spindles and about 1,000 looms, for the manufacture of ginghams. There will also be a large electrical plant for supplying power to these mills and the Mechlingburg Mills.

North Carolina, Hickory. Another new cotton mill is projected at this place.

*North Carolina, Lincolnton. Operations are expected to start about October 15th, by the Wampum Cotton Mills, which have already started construction of necessary buildings. This company is capitalized at $160,000, J. A. Abernathy, president and R. S. Abernathy, treasurer. They will make yarns, Nos. 50's to 80's ply, from Egyptian and Peeler cotton, operating 10,000 ring spindles and some twisting spindles. Steam will be motive power.

*North Carolina, Marshall. John J. Dalton of Ashville is the agent for Northern capitalists who are interested in the promotion of the cotton mill at Marshall, previously reported. It is understood that a site has been secured.

North Carolina, Newton. The Clyde Cotton Mills Co., has been incorporated with capital stock of $100,000 by J. C. Smith and G. A. Warlick. A plant of about 10,000 spindles for spinning and weaving will be built.

*North Carolina, Springhope. The cotton mill which was agitated several years ago is again being talked up, in connection with the cotton seed oil mill company of which J. B. Saunders is president.

*North Carolina, Statesville. The new plant in which the Whitman Mills have been reported interested, will be known as the Maumamet Mills. Fine goods are proposed.

*North Carolina, Statesville. N. B. Mills, Statesville, is president of the Bloomfield Manufacturing Co., previously reported to operate plant, with equipment of 5,000 spindles for making fine yarns, 60s to 80s. Work is progressing on construction of building.

*Oklahoma Territory, Shawnee. The cotton mill project is again being revived, and the city council has granted land for the plant. A company known as the Shawnee Cotton Factory has been incorporated with $150,000 capital. Frank Stearns is the resident promoter.

Pennsylvania, Philadelphia. Harry B. Clapp & Co. is the name of a new corporation, capital stock $30,000, to manufacture and deal in cotton waste. Mr. Clapp was formerly of the Clapp & Fowler Waste Co., which recently dissolved. Mr. Fowler continues the old business and this new company is formed with H. D. B. Clapp, H. J. Fitzmaurice and M. Kendrick as directors.

*Rhode Island, North Smithfield. The Blackstone Mfg. Co. advises us that the equipment of the new mill that is being built at this place will be 40,000 ring spindles and 1,000 Northrup looms. The post office address is Blackstone. The officers will be the same as the Blackstone Mill.

*Rhode Island, Tiverton. The absorbent cotton factory at this place will have a capacity of 4,000 lbs. per day. James Schultz of the Estes Company, Fall River, will be the manager. W. J. Dunn of Fall River is the largest stockholder. The plant will start up about the first of September. Machinery is now being put in.

Rhode Island, Pawtucket. The Blackstone Webbing Company has been incorporated with capital stock of $50,000 by Eaton Cliff, Louis W. Bishop and Joseph L. Bodell. They will manufacture textile and rubber fabrics.

*Rhode Island, Pawtucket. The Blackstone Webbing Co. expects to begin operations about Sept. 1st making narrow fabrics, tapes, shoe webs and stay binding. Company is capitalized at $50,000. Eaton Cliff is president; Joseph L. Bodell, treasurer and Wm. J. Mason, agent and superintendent. They will have an equipment of 35 looms and use steam power. Goods will be sold through jobbers.

*Rhode Island, Woonsocket. Operations have been started by Brindle Bros., making narrow fabrics, viz: Battenburg lace, feather edge tapes and webbing, in silk and cotton. They have an equipment of 30 looms and use steam power. Sell goods direct.

South Carolina, Gaffney. E. R. Cash (Gaffney), D. A. Tompkins (Charlotte) and C. D. Elkin (King's Mountain) are interested in new cotton mill to be built here as the "Marie" Mills. Capital stock will be placed at $150,000, with privilege of increasing to $200,000.

*South Carolina, Pendleton. J. J. Sitton is president and treasurer of the Pendleton Cotton Mill, recently incorporated with capital stock of $65,000 to operate mill at this place. Plant will be equipped with 3,000 spindles for making yarns 20's to 30's, warps and twists. Contracts for buildings and machinery will be awarded before August 1st.

*Virginia, Danville. Mill buildings for the Dan River plant are approaching completion, and are almost ready for machinery.

Enlargements and Improvements.

Alabama, Anniston. The Anniston Mfg. Co. is putting an extra story on its mill to increase its capacity. The plant has shut down pending improvements.

Georgia, Athens. Arrangements are being made by the Athens Mfg. Co., to replace all the carding and spinning machinery now in use, with new. The plant has been closed for the summer, during which time the machinery will be installed.

Georgia, Thomaston. Since their reorganization, the Thomaston Cotton Mills have been very successful, and at the last annual meeting the stockholders voted to increase the capital stock $50,000, and some additions will be made to the plant.

Illinois, Rock Island. The Rock Island Cotton Mills Co. will move shortly into the three-story building on First Avenue, where up-to-date machinery will be installed, greatly increasing the present output. Work has been started on remodeling the building.

Massachusetts, Lowell. The Massachusetts Mill at Lowell is changing over two more boarding house blocks into storehouses. They are also adding one more story to their cloth room.

Massachusetts, Salem. A new power house will be built for the Naumkeag Cotton Mills in which a 1,500 horse power engine will be installed. The plant will be shut down during the changes.

North Carolina, Concord. The Cannon Manufacturing Co. is to equip their No. 1 mill with new (Whitin) cards.

North Carolina, Mooresville. The No. 2 mill of the Mooresvile Cotton Mills is to be enlarged. Contract has been awarded for construction.

North Carolina, Reidsville. The Reidsville Cotton Mills will increase their capital stock to $400,000. It is expected that the increased capital, amounting to $$250,000, will be used for enlargement.

*North Carolina, Winston-Salem. The Arista Mills Co. advises us that its capital stock will be $350,000. This is the consolidation of the Arista Mills of F. & H. Fries and the South Side Mfg. Co. The new officers are not yet elected. An addition

to the plant will be made, containing 4,480 spindles and 210 looms, and negotiations are now pending for the necessary machinery and supplies.

North Carolina, Worthville. The Worth Mfg. Co. expects to change its product from white to colored goods, and may increase its capacity.

Massachusetts, Lowell. The Appleton Co. are taking down their office and machine shop buildings, and also cotton storehouse, and will build a large mill in their place.

Pennsylvania, Chester. The Irving & Leiper Manufacturing Company have made many improvements to their plant within the last few months. They have added new cards from the Saco & Pettee Machine Works, "Kitson" pickers and Whitin drawing frames, making a complete and up-to-date equipment.

Pennsylvania, Chester. T. I. Birkin & Co., 2d, Clayton and Trainer Streets, have shut down their plant for one week in order to enable them to take account of stock, repair their machinery, etc. Mr. J. A. Smith, the agent for this mill, states that they are very busy turning out lace curtains, nettings, edgings and bed sets.

Pennsylvania, Philadelphia. Oehrle Brothers & Company, 1002-4 Arch St., Philadelphia, have removed to the S. E. corner of Third and Willow Sts., where they are now occupying three floors manufacturing upholsterers' supplies, etc.

Rhode Island, Ashton. Extensive improvements are under way at the Lonsdale Co.'s Mill. A new 1,200 h.p. engine is to be installed, replacing an old one of 400 h.p. A new chimney will be built and four new water tube boilers installed, taking place of upright ones. New spinning frames will replace old ones and a number of new looms will be added. They expect to have the work completed by end of summer.

Rhode Island, Warren. The Warren Manufacturing Co. has begun work on construction of new buildings in connection with the main plant. About $20,000 will be expended.

*Rhode Island, Woonsocket. Naushon Company confirm our report of the removal of their plant to Valley Falls. They manufacture fancy dress goods, and in their new quarters will use electric power.

*South Carolina, Cateechee. Building contract has been let for the 5,000-spindle addition to the Norris Mill.

*South Carolina, Clifton. The stockholders of the Clifton Cotton Mills have voted to increase the capital stock $750,000. The mill was damaged by the flood, and the plant is being repaired and probably additions will be made.

South Carolina, Cowpens. New boilers are being installed in the Cowpens Mfg. Co.'s plant. It is thought that it will take about four weeks to complete same, during which time the plant will be closed.

*South Carolina, Easley. The Easley Cotton Mills, which have increased the capital stock $150,000, will instal 9,000 additional spindles and 300 looms in the plant. This will give them a total, when completed, of 35,642 spindles and 1,000 looms. Make 3 1/2 to 6 yard sheetings.

*South Carolina, Pacolet. At meeting held recently by the stockholders of the Pacolet Mills, it was decided to increase the capital stock from $1,000,000 to $2,000,000 for purpose of rebuilding the mills damaged by the recent flood.

South Carolina, Tucapau. A new power plant is to be built for the Tucapau Cotton Mills, in which equipment will be installed for developing water power to run the mills and electric plant. C. R. Makepeace & Co. of Providence are the engineers in charge.

*South Carolina, Union. The Monarch Cotton Mills, previously reported to instal 26,000 spindles and 640 looms, expect to have 14,000 spindles and 375 looms in operation within sixty days. The balance of the new equipment will be installed later.

Tennessee, McMinnville. The Great Falls Cotton Mills, which were purchased by Charles H. Fisk of Detroit, and other capitalists, in connection with water powers, propose re-organizing the Great Falls Power Co. and expending about $250,000 for water power developments. Enlargements will probably be made to the mill.

*Texas, Weatherford. The Weatherford Cotton Mills advise us that all the necessary capital has been subscribed for the addition to their plant. They will begin to build at once, and expect to get into production September 15. They will add 2,304 new ring spindles for the manufacture of hosiery yarns, 20's to 30's, sold through Buckingham, Paulson & Co.

Virginia, Petersburg. The Chesterfield Mfg. Co., which purchased the Quinn Cotton Mill some time ago and has been running the spinning for its own knitting mill in Kinston, is overhauling the plant at the present time and taking out the looms and remodeling the mill.

Mills Starting Up.

*Alabama, Huntsville. The Dallas Mills now have the whole of their new plant in operation.

*Alabama, Pell City. The Pell City Manufacturing Co. has begun operations.

*Massachusetts, Fall River. The machinery in the new Davis Mill started up this week. They have enough cotton to last until the new crop.

Massachusetts, Fall River. Many of the mills in this city are running short time on alternate days, and probably will continue to do so until the new crop comes in.

New Hampshire, Claremont. The Monadnock Mills Co., which has been shut down during the month of July, to enable the belachery to catch up and also to make repairs, starts August 3d.

*Texas, Brenham. The Brenham Cotton Mills will be ready to start up when the new crop comes in.

Mills Shutting Down.

Connecticut, Middletown. The Russell Mfg. Co. has closed down two of its mills for an indefinite period.

Georgia, Athens. The Princeton Mfg. Co. has discontinued operations for a few weeks, during which time the necessary improvements will be made to the plant.

Georgia, Gainesville. Operations have been discontinued until fall by the Georgia Manufacturing Co., on account of high price of cotton, and shortness of their supply.

Maine, Lisbon. The Farwell Cotton Mills will shut down the first two weeks in August for repairs and alterations.

Massachusetts, Fall River. The Davol Mills will shut down July 11th., for three or four weeks, during which time new boilers will be put in.

Massachusetts, Newburyport. The Peabody Mill No. 1 is shut down.

Massachusetts, Taunton. Operations will be discontinued for about two weeks in August, for purpose of installing a new boiler by the Oakland Mills.

Massachusetts, Whitinsville. The mills in the Whitinsville district are curtailing production to some extent by shutting down for a week.

Massachusetts, Williamstown. The mills of the Williamstown Mfg. Co. are closing down for a week.

Massachusetts, Waltham. The Boston Manufacturing Co. will shut down July 3, and resume operations on the 13th. Plant will be closed again on Aug. 21, and re-start Sept. 8.

Rhode Island, Arcadia. The Rodger Williams Cotton Mills have been shut down for an indefinite period owing to cotton market.

Tennessee, Pinewood. H. H. & T. H. Graham have discontinued operations in their mills. The condition of the cotton market is given as reason for shut down.

WOOLEN.

New Mills.

*Maine, Corinna. Chas. A. Greenwood & Co.'s new mill, replacing the one destroyed by fire last March, has been completed.

*Massachusetts, Lowell. The Bigelow Carpet Co. has its new mill nearly completed. It will be a large addition to their plant. It is understood that they are to tear down their machine shop and build another new building in its place.

New Hampshire, Laconia. The Laconia Woolen Co. is the name of a new concern which is being organized and will soon be incorporated, as soon as deeds can be obtained for the Guilford Hosiery Mill property. Albert Crabtree, formerly of Clinton and later of Lakeport and Laconia, will be the manager. They will manufacture dress goods. A new dye house will be built and flume repaired and other improvements made.

*North Carolina, Spray. Plans have been prepared for the erection of a 4-set mill for the Spray Woolen Mills Company, in which B. Frank Mebane is interested. Other equipment will consist of 2,600 mule spindles and 60 looms for making blankets. The building will be 275 by 75 feet.

*Oregon, Marshfield. The North Bend Woolen Mills Co., the incorporation if which was reported under the head of North Bend, some weeks ago, has purchased most of the machinery in the Napa Woolen Mill, which has gone out of business. Machinery is now being shipped to Marshfield. It is also their purpose to remove the machinery of the woolen mill at Bandon to the new plant. The Bandon Mill contains three sets and eleven broad looms, and the Napa Mill is a five set mill with twenty-six looms.

*Pennsylvania, Chester. The Powhattan Manfg. Co. operates one of the Esrey Mills. There are now 100 looms in operation in the plant. The new company, however, will largely increase the machinery capacity. The goods will be sold through a New York commission house. They do their own dyeing.

*Pennsylvania, Chester. The Highland Mills Co., H. E. Mitchell & Company, proprietors, is a new company which has taken up quarters in one of the old Esrey Manfg. Co. Mills for the purpose of manufacturing woolen and merino yarns. The members of the firm consist of Mr. James Logan, Jr., and H. E. Mitchell, both young and energetic men. The equipment of the plant consists of 6 sets cards and mules, also 20 90 in. looms and 64 48 in. looms, which they expect to operate in the near future. Business with them is good. The superintendent is James Dalton, Sr. Mr. Mitchell states that they will soon put in some new doublers and reels, which have not yet been ordered.

*Pennsylvania, Harrisburg. B. F. Eby is treasurer of the Harrisburg Woolen Company recently incorporated. Orders will soon be placed for the machinery, which they contemplate having in operation by October 1st.

Pennsylvania, Philadelphia. The Fairhill Waste & Shoddy Co. is a new concern recently started at 2746-50 Fairhill Street, making high grade cotton and woolen waste and shoddy. They operate one card, one picker and one baling press, using steam power. John H. Sedgwick is manager of the concern.

Pennsylvania, Philadelphia. The Philadelphia Axminster Carpet Co., a new concern, is manufacturing fine carpets in the Fretz Building, 10th and Diamond Streets, Philadelphia. The officers of the company are George Flint, president; James Hallowell, vice-president and John Thomson, Jr., secretary, treasurer and superintendent. Eight looms are new being operated. Eighteen more have been ordered. When fully equipped this company expects to have thirty looms in operation.

Pennsylvania, Philadelphia. A new carpet mill is to be erected at corner of Glenwood Avenue and

Mascher Street, by Emil Hartmann. The main building will be 101 by 71 feet, 5 stories, with boiler house, 41 by 22 feet, one story.

*West Virginia, Keyser. The Patchett Worsted Company, recently incorporated with capital stock of $100,000, will start operations early in fall, making worsted yarns, from 1's to 40's, any fold. F. M. Reynolds is president of the company; Jos. E. Patchett, treasurer, and John B. Isles, superintendent. They will equip mill with 3 worsted cards, 4 combs and 2,000 worsted spindles and will use the Bradford system. A dyehouse will also be attached to the plant, to be operated by steam. Product will be sold direct.

*Tennessee, Springfield. The Springfield Woolen Mills Co. have broken ground for the new two-set mill previously reported.

Enlargements and Improvements.

Connecticut, Hanover. Plans are being prepared for the erection of a brick addition, 25 feet long, two stories, and picker house, 54 by 45 feet, one story, for the Airlie Mills, Angus Park, proprietor.

Connecticut, Mechanicsville. The French River Textile Company will install additional carding and spinning machinery in the mill.

*Iowa, Webster City. The Northwestern Felt Shoe Co., capitalized at $100,000, will begin operations in about 40 days in the mill which is being rebuilt to replace the plant destroyed.

Connecticut, Middletown. The Rockfall Woolen Co. will soon start work on erection of a new dye house.

*Connecticut, Thompsonville. Work is nearly completed on the new power plant for the Hartford Carpet Corporation. The plant, with exception of the Brussels department, for which two extra motors are to be received, has been started up with the new system of electricity.

Kentucky, Adairville. The Red River Woolen Mills have installed a wool picker and added a condenser for finisher card.

Maine, Oakland. The Cascade Woolen Co. contemplates making some extensive repairs to the plant, which will necessitate shut down of the mill until September.

Massachusetts, Pittsfield. Some spinning machinery is being installed in the Taconic Mills.

New Hampshire, Bristol. The Dodge-Davis Mfg. Co. has added 10 looms and some wool scouring machinery to its equipment recently.

New Hampshire, Manchester. Under the new management many changes and alterations are being made in the Manchester Mills. The dyehouse, print works and cloth rooms are being remodeled and new roofs put on and the floors generally are being strengthened and relaid, and machinery rearranged.

New York, Binghamton. The Binghamton Felt Co. will spend about $40,000 in the extension and improvement of its plant.

*New York, Binghamton. The Binghamton Felt Co. expects to get its addition completed about the 1st of September. They make all grades of felting, and are expending about $40,000 in improvements.

New York, Marcellus. An addition is being built to No. 1 mill of the Crown Mills for carding and spinning purposes. A new boiler house is also under construction, and in which three new boilers will be installed.

Oregon, Eugene. The Williamette Valley Woolen Mfg. Co. has increased its capital stock to $100,000.

Pennsylvania, Bristol. William H. Grundy & Company are about to erect a new boiler house as an addition to their plant. Operations will be commenced at once.

Pennsylvania, Chester. The Chester Worsted Company is very busy on high grade worsted yarns only. Mr. J. W. Turner is the superintendent of the mill and was formerly connected with the Griswold Worsted Company, Philadelphia. They expect to add new machinery at an early date.

Pennsylvania, Conshohocken. H. C. Jones & Co. are putting in a new power plant, and for the next two weeks the plant will be shut down.

*Pennsylvania, Lenni. The large addition to the Brookside Mills, recently purchased by George Brown & Sons, is well under way. A new weave shed is being built and other repairs made. It is probable that the mill will be started up in the fall.

*West Virginia, Martinsburg. The Crawford Woolen Co. will install a set of 60-inch cards and about twenty looms in the addition previously reported.

Pennsylvania, Philadelphia. Louis Walther, who for several years manufactured dress goods for ladies' wear at the corner of 3rd and Lehigh Avenue, Phila., has removed his establishment to the Fretz Building, 10th and Diamond Streets, where he is very busy. The main office of this mill is in New York. Business with them is very good.

Pennsylvania, Philadelphia. Messrs Dornan Brothers, carpet manufacturers at 1518 Howard Street, are about to have erected a four-story and basement brick structure, 60 by 116 feet, with a lantern roof which they will use for the purpose of storing carpets. The plans have been prepared and work will be begun at once.

Rhode Island, Bridgston. The Laurel Hill Yarn Co. is putting in a new set of cards.

Rhode Island, Chepachet. William H. Prendergast has thrown out the old looms from the Spring Grove Woolen Mills, and is putting in new.

*Rhode Island, Pascoag. Work on the new dye house for F. L. Sayles & Co.'s mill is under way. Foundation is finished, and the frame building is under construction.

Rhode Island, Westerly. The Solway Mills have installed 20 new looms in the plant.

Vermont, Cavendish. A new dry house is being built for Gay Bros. They will instal a new dryer in same.

Vermont, Ludlow. An additional set of cards have recently been installed in the Ludlow Woolen Mills.

Vermont, Ludlow. An addition, 70 by 20 feet, is being made to the main building of the Black River Woolen Mill. A new set of cards and new spinning machinery will be added.

West Virginia, Martinsburg. An enlargement is to be made to the Crawford Woolen Co.'s mill, now equipped with 50 looms. Site for additional buildings has been secured.

Mills Starting Up.

*Connecticut, Norwich. It is expected that the Reliance Worsted Co. will be ready to begin operations in its new modeled mill at this place about the 1st of September. Machinery will be transferred from Woonsocket to Norwich by degrees as they are very busy.

Maine, South Windham. Robinson Woolen Mill, which has been shut down for several weeks for repairs, has started up again.

*New Jersey, Trenton. Operations have been resumed in the woolen mills formerly operated by S. K. Wilson, by Alfred H. Ryan, proprietor. The plant has been greatly improved.

Rhode Island, Davisville. The Davisville Woolen Co. will start up the woolen mill here, which was shut down some months ago, on account of financial difficulties. W. A. Reynold will be agent.

Texas, Pittsburg. Thomas Davenport is endeavoring to perfect plans to start up the woolen mill at this place, which has been idle for some time; in fact, it has never been started up. The stockholders have been unable to find the right practical man to manage the enterprise and make an investment in it. The Dallas Commercial Club have appointed a committee to investigate the proposition and help it along, if it seems expedient.

Wisconsin, Jefferson. Cairns, McDonald & Co. are now proprietors of the Jefferson Woolen Mills. They manufacture blankets, cassimeres and meltons, operating one set cards and 5 looms. Use water power. A dye house is attached to the plant. Sell goods direct.

Mills Shutting Down.

Connecticut, Mystic. It is reported that the Rawitser Mill at this place will be shut down for an indefinite time as soon as the stock now on hand is exhausted.

Connecticut, Thompsonville. The Hartford Carpet Co.'s plant, which has been shut down for several weeks during changes in power plant, has started up.

Connecticut, Thompsonville. The entire plant of the Upson-Martin Carpet Co. has been closed, owing to scarcity of yarn, caused by textile workers' strike at Philadelphia.

Maine, Oakland. The Cascade Woolen Mill has been closed indefinitely on account of strike of the spinners.

Massachusetts, Lawrence. The usual summer shutdown of the Pacific Mills begins August 21st and lasts until September 7th.

*Massachusetts, Monson. The Heritage & Hirst Woolen Mill has been temporarily closed owing to financial embarrassment of the concern.

Maine, Dexter. The Stone Mill, owned by the Penobscot Woolen Co., and last operated by Walter Scott & Co., has been sold to D. R. Campbell, of Sangerville, Me. It will be started up about the first of August. It is a seven set mill, 35 looms.

New Hampshire, East Rochester. The annual two weeks' vacation shutdown at the Cocheco Woolen Mills begins July 31st.

KNIT.

For Knitting Mill News, see Knitting Department.

SILK.

New Mills.

*Connecticut, Norwalk. Samuel M. Green, of Holyoke, Mass., is the architect and engineer in charge of the new silk mill to be built for Otto Muller & Co. There will be a weave shed, 195 by 135, and a dye house, 195 by 85, with separate boiler and engine room and office building. Richard Muller will be the manager of the property, and will build a house nearby for his own occupancy.

New York, Amsterdam. A branch mill is to be established here by Julius Kayser & Co., silk glove manufacturers at Brooklyn. A building, 40 by 68 feet, two stories, will be built. The branch mill here will be used for sewing department and will furnish employment for about 75 people.

*New York, Binghamton. The new silk mill at this place will be known as the Chenango Valley Silk Mill Co. It is located on Robinson Street. Construction is under way. The building will be 50 by 150, three stories, brick. Power house, 30 by 40. W. J. Haskin is vice president and present manager. The mill will be equipped with about 200 looms.

Pennsylvania, Danville. The Pequot Silk Co. has been incorporated with capital stock of $25,000.

*Pennsylvania, Kutztown. E. G. Landru is president of the Berks Silk Company, recently incorporated to operate mill at this place. M. Landru is treasurer; Geo. Clair, secretary and J. Hengerch, superintendent. They will do silk throwing on commission, operating 7,500 spindles.

*Pennsylvania, Littlestown. The new mill under construction here for the Littlestown Silk Co., will be equipped with 10,000 spindles and 100 looms for manufacturing silk dress goods and throwing silk. The company is capitalized at $50,000. Henry Musser is president of the company; John F. Kissinger, treasurer, and Sydney H. Souter, superintendent and buyer. Will use steam power.

Pennsylvania, Reading. The Reading Hosiery Embroidery Company has been incorporated by Henry Luders, S. S. Miller and William H. Sando, for embroidering hosiery, linens and worsteds.

Personals.

Cotton.

Joseph Brady has resigned as overseer of weaving for the Hargraves Mills, Fall River, Mass., being succeeded by William Brocklehurst, of the Parker Mills.

Thomas F. Shea has resigned as overseer of mule spinning at the Greylock Mills, North Adams, Mass.

William C. Brown, overseer of dyeing in the Providence (R. I.) Dyeing, Bleaching and Calendering Company, has resigned to accept a similar position with the Clyde Bleachery & Print Works, River Point, R. I.

Arthur Sargent is now overseer of the cloth room of the Nashua (N. H.) Mfg. Co., having succeeded George A. Guild.

William Houston, formerly overseer of spinning at the Boott Mills, Lowell, Mass., has taken charge of spinning at the Greylock Mills, North Adams, Mass.

Howard Lown, formerly of the Flint Mills, recently assumed his new duties as overseer of the cloth room of the Arkwright Mills, Fall River. James Hetherington, the former overseer, is enjoying a brief rest preparatory to taking charge of the cloth room of the new Davis Mill.

William Reid, late of the Eddystone (Pa.) Print Works, has obtained a position as head printer at the Arnold P int Works, North Adams, Mass.

E. R. Simmons has resigned as overseer of carding for the Sun Mill at Fitchburg, Mass.

William Ritchie, who recently resigned as sketchmaker at the Arnold Print Works, North Adams, Mass., has taken a similar position in the print works at River Point, R. I.

James Pate, for many years overseer of the mule spinning at the Merchant's Manufacturing Co., Fall River, Mass., has resigned. Patrick Gallagher, overseer of mule spinning at the Acushnet Mills, New Bedford, Mass., has succeeded him.

Samuel Stocking has resigned the treasurership of the Atlanta Mills, Atlanta, Ga.

William Dunn is now overseer of carding and spinning at one of the Holt Mills of Burlington, N. C. He was formerly connected with the Troy (N. C.) Mill.

Henry McDermott, formerly superintendent of Laurens (S. C.) Cotton Mills, is now superintendent of the Natchez Cotton Mills, Natchez, Miss.

S. C. Mield, overseer of spinning at the Cordis Mill, Millbury, Mass., has resigned.

H. C. Phillips, Webster, Mass., has entered the employ of the Harmony Mills Company, Cohoes, N. Y., as an assistant manager.

George A. Guild, after a faithful service of forty-seven years at the mills of the Nashua Mfg. Co., Nashua, N. H., has resigned. He worked his way up to be overseer of the weaving department, and many years ago was transferred to the clothroom, of which he has had charge since the retirement of Overseer Geo. F. Shedd. Arthur Sargent, second hand, has been promoted to fill the vacancy.

William J. Gregory has resigned as foreman of the sketch room of the Clyde Print Works, River Point, R. I. Mr. Gregory has been with these works for over 25 years. The change of management of the works is bringing about many changes and a number of the foremen and also others are completing their duties. Thomas Rawlinson also severed his connection, after serving in the capacity of foreman of the dyeing department for over twenty years.

John Mott, overseer of bleaching at the mill of the Aspinook Co., Jewett City, Conn., has resigned.

Harry Pilkington, overseer of the carding department of the Tremont and Suffolk Mills, Lowell, Mass., has resigned.

J. Q. Murphy, who has had charge of the carding in mills 1, 2, 3 and 4 of the Nashua Co., Nashua, N. H., has severed his connection. H. N. Fish, who has had charge of the carding in mill No. 6, has been appointed as successor of Mr. Murphy. Albert G. Johnson, of Lowell, has been appointed as the overseer of carding room in No. 6 mill.

John Kenney has resigned as overseer of spinning for the North Pownal Mfg. Co., North Pownal, Vt.

B. E. Smith has resigned as overseer of the spooling room of the No. 4 mill of the American Thread Company, Willimantic, Conn., and has taken a position as secondhand of the twisting department of the No. 2 mill, and John McKean, who has heretofore been employed in the No. 2 twisting room, has been transferred to No. 4 mill as overseer of the spooling department.

Woolen.

H. J. Yarrington, overseer of finishing for Fairbanks & Dorr, Guild, N. H., has resigned.

John H. Oldham has resigned as finisher at the Hockanum Mills, Rockville, Conn., and has secured a position with the Slayden-Kirksey Mills, Waco, Texas.

Joseph Dowd is the new dyer at the Dodge, Davis Mfg. Co., Bristol, N. H.

M. J. Gallagher has resigned as overseer of drawing, twisting, spinning and spooling for the Moore Spinning Co., No. Chelmsford, Mass.

James L. Eadie has resigned as designer at the Fitchburg Worsted Mills, Fitchburg, Mass.

M. Shaughnessy, superintendent of the A. W. Darling Mill, Cherry Valley, R. I., has resigned.

Edward Manning, overseer of spinning at the Ashuelot (N. H.) Mill, has resigned.

George E. Parks of Hanover, Conn., is to have charge of the Stone Mill at Dexter, recently bought by D. R. Campbell of Sangerville, Me.

J. Delaney has resigned as overseer of weaving in the Airlie Mills, Hanover, Conn.

Joseph Pepper, Jr., has resigned as overseer of the finishing room of the Jefferson (Mass.) Manufacturing Company.

Daniel McGuire has resigned as overseer at the works of the Bellvue Mills and taken a similar position at the Clinton Worsted Mill, Clinton, Mass.

William Hirst, who for the past six months has been overseer of finishing at the Riverview Worsted Mills, Waterville, Me., has resigned, and accepted a position in Massachusetts. Samuel Wilson, formerly finisher percher in the Riverview Mill, succeeds him.

T. N. Rouse, formerly of the United States Bunting Co., Lowell, Mass., is overeseer of dressing, spooling and twisting at the Oakland Woolen Co., Oakland, Me.

Edward Newell, overseer of finishing for ten years at the Madison (Me.) Woolen Co., has resigned. William Burwood, Norwich, Conn., has taken his place.

George A. Spencer has resigned as superintendent at the Megunticook Woolen Co., Camden, Me. His place will be taken by Chester B. Allen. Mr. Spencer and his family have moved to Philadelphia.

Samuel Wilson has taken the place of William Hirst at the Riverview Worsted Mills, Waterville, Me., as overseer of finishing.

J. McGinn has resigned as overseer of finishing for the Oakland Worsted Company, Oakland, R. I.

George Mee has resigned as boss spinner at the Mayo Mill No. 1, Millbury, Mass.

Louis A. Anderson, formerely agent of the American Woolen Co.'s mill at Fairfield, Me., has taken the position of agent of the River Spinning Co., Woonsocket, R. I. Mr. Andrew Adie, who has been superintendent and agent of this plant for some years, retires.

Deaths.

Andrew Luscomb, of Kilburn, Lincoln & Co., manufacturers of cotton and silk looms, etc., Fall River, Mass., died recently. The deceased was born in Taunton on December, 26, 1832. At an early age he entered the Dean Bolt Machine Co., of Taunton to learn the machinist's trade, which he thoroughly mastered. Later he was in the employ of William Mason of Taunton. In 1862 he became associated with the firm of Kilburn & Lincoln, which is now incorporated as Kilburn, Lincoln & Co.

A. F. Gault, president of the Dominion Cotton Company, is dead.

George Church, president and treasurer of the Monument Mills, Housatonic, Mass., died at his home in Great Barrington, Mass., June 27.

Bernard Joseph Ward, the inventor of the Turkish towel, was buried July 30, from his home, 4201 Paul Street, Frankford. Interment was in St. Dominick's Cemetery.

Henry Almon Smith, president of the Blackstone Stocking Company, died late last month at his home, at Nyatt, R. I., after a long illness.

John S. Holden, senior member of Holden, Leonard & Co., woolen dress goods manufacturers, 76 years, died late last month at Saratoga.

Herman Kohler, a silk manufacturer of New York City, died at the home of his brother, Robert Kohler, at Adelphia, N. J., recently, aged 60 years.

Merrill Spring, one of the oldest residents of Valley Falls, R. I., died in that city recently. At the age of 22 years he was occupying the position of boss weaver in a mill in the town of Grafton, Mass. From there he moved to Valley Falls, where he was employed by Messrs. Chace as foreman of the weaving department for a period of over 27 years. He was afterward appointed superintendent of the mill of the Abbott Run Co., and retained that position until about a year ago, when the property was sold.

John R. Rostron, an overseer in charge of the carding department of the Lancaster Mills, Clinton, Mass., died last month.

Charles E. Peaslee, boss dyer at the Cowan Woolen Co., Lewiston, Me., was found dead in bed on July 10th. Death was due to heart failure. He had been at the Cowan Mill for about a year.

C. N. Draper of the firm of Draper Brothers Company, manufacturers of knit goods, Canton, Mass., died at his summer home, North Scituate, the first of last month.

Charles G. Latta, president of the Neuse River Mills and the Raleigh Cotton Mills, Raleigh, N. C., died recently, as the result of injuries received a year ago in New York by being struck by a cable car.

Nehemiah Randall died recently in North Scituate, R. I., at the age of 78. He was a well known superintendent, having been with the King Philip Mills, Fall River, Mass., the Slater Cotton Company, Pawtucket, R. I., and the Indian Orchard Company.

Thomas Chalmers, father of W. J. Chalmers, chairman of the Executive Committee of Allis-Chalmers Company, died July 13th and was buried Thursday, July 16th. Thomas Chalmers was the founder of the firm of Fraser & Chalmers, which firm was recognized as the world's largest producers of mining machinery.

Charles J. Strolls died recently. Mr. Strolls was born at Norwich, Conn., in 1877. When 14 years of age he removed with his parents to Georgia, and where the family resided until early in the last winter. He was engaged in setting up cotton machinery and had recently been employed by an agency for an English concern.

New Publications.

Textile World Record Official Directory of the Textile Industries, also Yarn Trade Index.

The 1903 edition of this annual work has been issued. It contains the usual features, Part I being a directory of textile establishments in United States and Canada, arranged according to states and towns where they are located, with full data about each mill, also maps of the manufacturing states, showing towns where there are textile mills. There is also an alphabetical index of all the mills, a separate list of mills with worsted machinery, detailed statistics of the spindles and looms in the United States.

Part II contains the Yarn Trade Index, giving a list of yarn manufacturers, classified according to kind of yarn spun. It gives the counts and the way in which yarn can be put up; also list of yarn dealers and agents.

Part III contains classified lists of mills doing commission and order work and different kinds of dyeing and finishing establishments, also lists of shoddy and extract manufacturers.

Part IV contains a list of dealers in raw materials, including cotton, wool, shoddy, rags and waste.

Part V contains lists of manufacturers' selling agents and dry goods commission merchants, manufacturing clothiers who buy direct from the mills, also suit and cloak manufacturers.

There is in addition a very complete classified index of builders and dealers in textile machinery and supplies, in which are grouped under the heads of different lines over 400 of the machinery and supply trade.

Price of Office Edition is $2.50; Travelers' Edition, in smaller size and flexible covers, $2.00, or with a year's subscription to the Textile World Record, is $3.50 and $2.50 respectively, according to the edition of Directory.

Lord & Nagle Company, publishers, 95 South St., Boston, Mass., 425 Walnut St., Philadelphia, Pa., 123 Liberty St., New York, and 115 Dearborn St., Chicago. It may be had at any of these offices.

Davison's Hosiery & Knit Goods Trade.

The thirteenth edition of this book has been received. It contains a directory of the knitting mills in the United States and Canada, attractively bound in convenient form for travelers' use. It also contains lists of jobbers and large retailers, manufacturers' agents, etc., making a specialty of knit goods. Price is $2. Published by the Davison Publishing Company, 401 Broadway, New York.

The Blue Book. The sixteenth annual edition of this well known work has been issued in its usual attracive form and containing the features and classifications of previous years. In the Office Edition a classified list of cotton and woolen mills has been added, giving the manufacturers under various headings in different lines. The book contains a directory of the textile manufacturers in the United States and Canada, commission merchants, yarn dealers, etc. It is published by the Davison Publishing Co., 401 Broadway, New York, in two editions, the Office Edition, price $4, and Travelers' Edition, $3.00.

A New System of Rewarding Machine Shop Labor; H. L. Gantt; The Cassier Magazine Co., New York City; price 10 cents.

This is the reprint of an article first published in Cassier's Magazine and which attracted much attention from machinists and engineers. It will well repay reading even by those who are not directly interested in those branches.

New Dictionary of Sciences; by MM. Paul Poire, Edmond Perrier, Remy Perrier, Alex. Joannis and a corps of editors; Ch. Delagrave, Paris; 3,400 pages, 5,400 illustrations; Price $12.00.

This elaborate work has been compiled for the purpose of presenting a summary of the sciences in their present state. The rapid progress during the past decade in all branches of scientific research has made the present cyclopedias out of date. The present work therefore comes at an opportune time and will be welcomed by that large number who desire a work of reference giving a carefully prepared abstract relating to the different subjects. The work, which is written in French, is profusely illustrated.

Cotton: by Prof. Dr. A. Oppel, Bremen; Duncker and Humblot, Leipzig; 718 pages, price, $2.50.

The earnestness with which Germany is promoting the raising of cotton in her possessions, and the thoroughness with which that work will be carried on, is exemplified in this elaborate German work on the history, cultivation and consumption of that great staple.

Fully two-thirds of the world's product of raw cotton is grown in our own Southern states, yet there is no book on cotton in the English language that excels, and few, if any, approach it in the extent of the ground covered, attention to detail, systematic arrangement or number of illustrations. This fact illustrates how different the cotton problem is for the German from what it is for us. Here millions of bales each year await only the seed and the labor of cultivation under the most favorable conditions.

Germany on the other hand must explore African wastes, contend with climatic conditions that are fatal to man and beast in order to raise cotton in her own colonies. Whether she succeeds or fails to make German cotton a considerable factor in the world's production, her endeavors to overcome these unfavorable conditions by patient, methodical and scientific operations are adding to the world's fund of knowledge regarding cotton.

Necessity is the mother of invention. Americans are under no such necessity as are the Germans for studying the subject, and, consequently, we find the best treatise on cotton appearing in the German language.

Our space does not allow us to give an extended review of the work, and we must content ourselves with giving a brief summary of the contents, showing the divisions of the subject:

1. History of Cotton from the Earliest Times.
2. The Cotton Plant.
3. Cultivation and Harvesting.
4. Development and Nature of the Fibre.
5. By-products.
6. Trade on Raw Cotton.
7. Cotton Manufacturing.
8. Commerce in Manufactured Products.

9. Cotton in Daily Life.
10. Cotton in Political Economy.
11 to 14. Cotton in the United States.
15 to 19. Other Countries Outside of Europe.
20 to 22. Europe.

The Cotton Spinner's and Twister's Adviser; by Otto Holtzhausen; Theodor Martin, Leipzig, Germany; price $1.50.

A hand-book containing a large amount of useful information arranged in a convenient form for reference. The following subjects claim the attention of the author: Yarn numbering; twist; changes of length by twisting; wet twisting; constants for calculations; practical and theoretical spindle driving; conditioning of yarn; strength and elasticity of yarn; production tables and calculations for drawing, spinning and twisting machinery; production as a basis for fixing wages; reeling; tables of square roots; twist tables. While the text is in German, the weights and measures are given to a very large extent in English units. With the exception of a brief explanation of the metric system of numbering and its relation to the English, the yarn counts throughout the work are those of the English system of 840 yards per pound.

Living Room; by Friederich Ratzel; H. Lauppischen Buchhandlung, Tuebingen; price, $1.00.

In this study of the capacity of the earth to sustain human life the author gives his views of the relation existing between that capacity and the present population. It is a careful treatise on a subject whose importance is but imperfectly realized. The text is in German.

Technolexicon; Dr. Hubert Jansen. Dorotheenstrasse, 49, Berlin (N. W. 7), Germany.

In the beginning of 1901 the Society of German Engineers (Verein Deutscher Ingenieure) began the compilation of a universal technical dictionary in the three languages English, German, and French. This undertaking has met with general approval and has received assistance from all quarters at home and abroad. Societies and individuals have responded generously to the invitation to collaborate and have proved their interest by the transmission of collections of technical words made by them or by promising such in the near future.

Up to now (May, 1903), there are 341 societies (42 in English, 272 in German, and 27 in French speaking countries) co-operating in the work, either by the systematical collection of technical expressions of the specialties represented by them or in other ways, especially by the acquisition of collaborators and by placing technical publications in more than one language at the disposal of the "Verein," as catalogues of firms, inventories, piece-lists of machines, handbooks, etc. Through these societies the Technolexicon has found helpers in Great Britain, Germany, France, the United States, Austria, South-Africa, India, Australia, Belgium, Canada, etc.

As the contributions will not be called in before 1904, all who wish to help in the compilation of the Technolexicon have still time and opportunity to assist in the preparation of their specialties. Contributions from all technical branches (including the handicrafts) are welcome, and it is obvious that small contributions from a host of various collaborators will be more useful than large ones compiled by a few men, who naturally cannot cover so many specialties. Attention is to be drawn to the fact that contributions in only one language are also most acceptable, though of course those in two or three languages are the most valuable, as also polyglot business-catalogues and other technical publications. Delayed contributions, if they arrive before the end of 1906, when we shall begin to print, can still be made use of.

The Editor-in-chief will be pleased to give any information wanted.

Business Literature.

Hopedale Warpers; The Draper Co., Hopedale, Mass.

This is a circular calling attention to the well known Draper warpers and the various improvements that have been made recently in this machine.

Dutcher Patent Temples; The Draper Co., Hopedale, Mass.

A card calling attention to the improvements recently made in the Dutcher temples manufactured by the Draper Co.

Bulletin of the Lowell Textile School Lowell, Mass.

The May issue of this publication, which appears quarterly, contains an account of the exercises at the dedication of the new school buildings and has therefore been appropriately styled, "The Permanent Home Dedication Number."

Morehead Traps; American Blower Company, Detroit, Mich.

An illustrated circular in which are described the various types of Morehead return traps manufactured by the American Blower Co.

Mining Machinery; Jeffrey Mfg. Co., Columbus, Ohio.

This is a catalogue of the mining machines, tools and appliances manufactured by the Jeffrey Mfg. Company. The pamphlet is profusely illustrated with fine engravings showing the machines, many of them in full operation in the mines.

Annual Report of the Alumni Association of the Philadelphia Textile School.

The second annual report of this association just received is especially interesting as it contains the papers read at the recent meeting. In addition it contains the usual material found in these reports including the constitution, by-laws, list of officers and members, and the treasurer's report. There is also a biographical sketch of Theodore C. Search, the founder of the Philadelphia Textile School, and the present president of the Philadelphia Museum and School of Industrial Art.

use Dixon's Compound in making pipe joints.

Gas Bowers and Exhausters; Buffalo Forge Company, Buffalo, N. Y.

The Buffalo gas exhauster is used for removing acids and other chemical fumes which require an interior construction impervious to the action of the gases. The company have recently issued a

pamphlet describing the various types of gas exhausters manufactured by them.

Dixon's Pipe Joint Compound; Joseph Dixon Crucible Company, Jersey City, N. J.

The merits of Dixon's pipe joint compound are told in this booklet in the form of a story on making repairs to pipes, the plain moral of which is to

Coffee Catalogue; The George L. Squier Mfg. Co., Buffalo, N. Y.

This is an illustrated catalogue in Spanish describing the various coffee machines built by The George L. Squier Mfg Co., Buffalo, N. Y.

The Cooper Mercerizing Company.

This growing concern is now located at its new works at Coventry, R. I., where it has a large and well equipped plant which enables it to handle much more work and more promptly than before. It has also added recently a large warp mercerizer. The new plant includes a fine bleach house and also a dye house. These additions enable it to turn out work promptly and economically, and it is prepared to quote as low prices as consistent with good work. Since February the management has been as follows: Mr. William Grandage is the superintendent and general manager, a man of wide experience, who is a practical dyer, bleacher and mercerizer; Mr. Louis A. Gardner, agent; Mr. Charles E. Townley, president; Mr. W. A. Gardner, secretary and treasurer.

A Summer Paradise.

New Jersey is a pioneer state as a summer resort, and every nook and corner has some seductive attraction. The entire coast line is devoted to summer resorts of unequaled prominence, and the more noted watering places include Atlantic Highlands, Seabright, Monmouth Beach, Long Branch, Elberon, Deal, Allenhurst, Asbury Park, Spring Lake, Belmar and Point Pleasant, Beach Haven, Barnegat, Atlantic City, Sea Isle City, Ocean City and Cape May. The interior of Jersey also has many charming resorts, including Lake Hopatcong, Mauch Chunk, Glen Summit, Harveys Lake and Lehigh Gap. The story of these resorts is told interestingly in "Sea Shore and Mountains," an illustrated booklet issued by C. M. Burt, Gen'l Pass. Agent, New Jersey Central, 143 Liberty Street, and is sent upon receipt of 6 cents in stamps to any address.

Now in Operation.

The Chester Worsted Co., Chester, Pa., announces that its new worsted plant is now in operation, and it is prepared to fill orders for worsted yarns in various grades and numbers. Its mill is equipped with new and improved machinery. Mr. E. G. Harper, 395 Broadway, New York City, has been appointed sales agent for the East, Manhattan district and Western territory for "Chester Yarns." Inquiries for prices and samples may be addressed to Mr. Harper. Yarns are furnished either dyed or in the grease.

A Successful Mill.

The Standard Knitting Mill, Knoxville, Tenn., shipped four carloads of their products to Kansas City in one week last month. The shipments were composed of 12-pound goods in tan, blue, and Egyptian shades. This firm is now manufacturing a very fine line of 5 1/2-pound combed and combed Peeler in natural colors, also in tan, pink and blue. Prices have been advanced over those of last year; the fabric and finish is equal in every respect to the standard of previous years.

Time is Money.

The belief that time is money is evidenced by bleachers and dyers of cotton in the increased use of Oleine, manufactured by Bosson and Lane, Atlantic, Mass. If used in a bath in which the cotton is soaked it saves much time in boiling, insures uniform work and gives brighter and faster colors. In dyeing with direct colors the Oleine may be used in the dye bath. When used before bleaching, less chloride of lime is required and the cotton is left much softer.

The G. Drouve Company.

Among the concerns which have recently installed the Lovell shutter and window opening device manufactured by the G. Drouve Company of Bridgeport, Conn., we note the following: Thomas Davidson Mfg Co., Montreal, Canada; Fred L. Sayles Co., Pascoag, R. I.; Clinton Woolen Mfg. Co., Clinton, Mich.; Ravine Mills Co., Vernon, Conn.; E. Ingraham Co., Bristol, Conn.; Union Steam Pump Co., Battle Creek, Mich.; Lamb Knitting Machine Co., Chicopee Falls, Mass.

Rhode Island, Providence. The National Ramie Co. has been incorporated under the laws of Maine, with a capital stock of $300,000. Among Providence parties interested are L. M. Cook, receiver of the American Tube & Webbing Co., Morris H. Cook, Peter H. Cochrane, B. S. Clark, also Joseph Ainley of East Weymouth, Mass.

A Wide Awake Knit Goods House.

One of the most progressive and enterprising firms in the hosiery and underwear jobbing business in Philadelphia is Messrs. Ellis and Brothers, located at 430 Market Street. This firm has occupied these quarters since February last and their business has advanced far in excess of their expectations since this change has been made. They handle an extensive line of hosiery and underwear and are highly successful in holding their many customers. The individual members of the firm are Abram L. Ellis and Kain Ellis and they have been in business for quite a long period. On account of their increased business the Messrs. Ellis have in contemplation, at the present time, the erection of a warehouse to accommodate the extensive stock which is necessary for them to always have on hand. They occupy almost the entire building at

434 Market Street, which extends through to Ludlow Street. It has been thoroughly remodeled and equipped with all the latest improvements.

New Selling Methods.

The purpose of the Washington Mills Textile Co., of Camden, N. J., just incorporated with capital of $25,000, we learn, is to engage in the selling of cotton, woolens, worsteds and silks, through a circuit of stores controlled by the company of which they now have three in operation in different parts of the country. The idea is to make contracts for the output of different mills, doing away with the middle men, and selling the goods direct by this means. The main promoters of the enterprise are Mr. Duval, of Duval & Jones, 74 and 76 Duane St., New York; Mr. C. C. W. Wilson, traveling agent for a large dye house in Philadelphia, and Mr. Patterson, who is now connected with a large mill in Maryland. The project, one of the incorporators states, is meeting with great favor, several large mills in this vicinity holding stock, and it is the object of this company, their charter being elastic, to increase their capital for the purpose of buying out such mills as they deem fit, thereby gaining absolute control of their production.

A New Supply House.

The J. S. Turner Mfg. Co., 398 Middlesex St., Lowell, Mass., has been incorporated under Massachusetts laws to manufacture and deal in mill supplies of all kinds. Mr. J. S. Turner, manager, has for the past six years been connected with the North Chelmsford Supply Co., and has had a wide experience in all branches of that business, especially on worsted mill equipment. Previous to that he was with the Lawrence Supply Co., for eight years as manager and salesman, and he has bought out this company and moved its machinery to Lowell. Their specialties include all sorts of worsted mill supplies and repairs, comb circle and faller work, worsted roll covering and oak-tanned leather belting.

Along the New England Shore.

Ocean bathing is the chief delight of the summer sojourner at the seaside resort, and this fact alone would tend to make Northern New England's sea coast the popular Mecca for summer travel; but the pleasures of the seashore are not confined entirely to bathing by any means.

The beautiful opportunity for yachting along the coast of Marblehead, the grand scenery of Gloucester and the Cape Ann territory; the large and beautiful golf links which have now become a feature of the larger resorts; the summer theatres where the best of vaudeville entertainments are given, and the grandest summer hotels in the country, all these and other features combine to add to the enjoyment of life at the seashore.

These famous resorts are described in a delightful and interesting manner in the booklet "All Along Shore," issued by the Passenger Department, Boston & Maine Railroad, Boston. The portfolio, "Seashore of New England," contains thirty-one magnificent views of scenery along the coast and will be mailed upon receipt of six cents in stamps. The descriptive book will be mailed upon receipt of two cents in stamps.

The Burt Exhaust Head.

The Burt Mfg. Co., Akron, Ohio, recently received their 12th order for exhaust heads from the Baldwin Locomotive Works. The order this time was for 12 heads, making a total of 33 Burt exhaust heads now in use by the Baldwin Co. This goes to show that the Burt exhaust head is all its makers claim for it; they are every day getting flattering testimonials in the form of repeat orders and letters from those who use it.

The Burt exhaust head is an appliance to fit over the end of the exhaust pipe, and while allowing the dry steam to escape, effectually prevents oil, water or wet steam from getting out to rot roofs, and disfigure walls.

A booklet describing the Burt exhaust head will be sent by the Burt Mfg. Co. to all who ask for it.

A New Railroad Book.

New Jersey is in every sense a typical vacation region, and each year brings greater developments and improvements for the entertainment of the pleasure seeker. The Shore, which is reached best by the New Jersey Central, includes Atlantic Highlands, Navesink, Seabright, Monmouth Beach, Allenhurst, Deal, Asbury Park, Ocean Grove, Spring Lake and Point Pleasant. To these points there is fast express service at almost every hour, while the New Jersey Central's Sandy Hook boats afford a delightful sea trip to Atlantic Highlands, from which point trains convey passengers to the above points. Atlantic City, Cape May, Ocean City, Tuckerton, Beach Haven, are also reached by the New Jersey Central by fast express trains, while the interior resorts, including Lake Hopatcong, Mauch Chunk, Harvey's Lake, have greatly improved service. The New Jersey Central has just issued a new booklet, known as "Sea Shore and Mountains," descriptive of the region traversed by that road. The book was gotten up regardless of expense, is printed on fine paper and has nearly 150 illustrations of scenes along the line of the road. This book is sent to any address upon receipt of 6 cents in stamps by C. M. Burt, Gen'l Pass. Agent, New Jersey Central, R. 803, New York City. Send for it.

A Branch Office.

Scott & Williams, builders of knitting machinery, Philadelphia, Pa., have recently opened an office in Arcade Bldg., Room No. 4, Utica, N. Y., where they will keep a complete line of machinery, also carry in stock a line of parts, supplies and needles.

Mr. L. H. Wild, formerly superintendent of knitting for the Oneita Knitting Mills, Utica, N. Y., will have charge of this office. Mr. Wild has had a large experience on this class of machinery, which, coupled with the fact of keeping a complete line of parts and needles located in the heart of this im-

portant district, will be appreciated by their many customers.

Mr. Wm. A. Ainsworth, who has been connected with the concern for many years, will be located at their main office in Philadelphia, and will be pleased to have any of his old friends and customers call when in town, and will be always glad to give any information or assistance in this line, either through Mr. Wild, or directly, as heretofore.

Working Night and Day.

Both the iron foundry and the new steel plant of the Diamond Drill & Machine Co. of Birdsboro, Pa., continue to run night and day, and they are shipping castings in from one to four weeks from receipt of order. Despite their present excellent facilities for turning out work, their modern methods and equipment, it has been found necessary to build another open hearth furnace to accommodate the large and ever increasing volume of business. Their machine shop also shares in the general prosperity, giving Birdsboro the appearance of one of the busiest towns of its size in the state.

A Pretty Compliment.

The eastern delegates to the recent Convention of the International League of Press Clubs at Atlantic City selected the New Jersey Central as the official route from New York. And in the last issue of the New York Insurance Journal the appreciation of the party was expressed as follows:

The New York delegation journeyed over the Central Railroad of New Jersey. The trip over this excellent road, which has been greatly improved in recent years, is most delightful, and the trains are equipped with every appliance for the comfort and convenience of passengers.

Sizing and Finishing Compounds.

The Arabol Mfg. Co., 100 William St., New York, invite all having any difficulty with sizing or finishing or who desire to improve these processes to write to them for information on the subject. Their experience, modern facilities and scientific management enable them to supply the advice and material required to meet the varying conditions of manufacturing.

Vacation Resorts and How to Reach Them.

AN IDEAL PORTION OF NEW HAMPSHIRE.

Puzzling indeed is the vacation question to the person who is about to select a resort to rusticate in. New England, of course, is the Mecca, but then New England covers a large area, and it is impossible to visit at one and the same time the forests and lakes of Maine, the beautiful sea coast, the delightful White Mountains of New Hampshire or the verdant hills of Vermont and beautiful valleys and meadows of Massachusetts. However, a choice must be made and that right quickly, for the summer does not last long, and the tardy chooser is apt to see a little white frost before he settles on his resort.

Now, before starting, prepare yourself and do it properly. There is just one necessity, one guide, that is all, the "Tourist 1903 Book" published by the Boston & Maine Passenger Department, Boston. This book contains a list of resorts in Maine, New Hampshire, Vermont, Massachusetts, Eastern New York and Canada. It gives all the hotels at these resorts, railroad rates, hotel rates, accommodations, etc. This book will be sent free. If you have not any resort in mind, just consider that section of New Hampshire known as the "Monadnock Region," a charming elysium where mountains and hills and verdant meadows send forth cooling breezes which waft over the valley of the Monadnock like a perfumed breath. Forest covered hills and high mountain tops abound such as "Joe English," "Monadnock," etc. Beautiful townships, famous for their past history as well as their present beauty, "Hilford," "Amherst," "Ponemah Springs," "Peterboro," Jaffrey," etc.; enterprising cities but none the less desirable as summering sections such as Keene, etc., such is the "Monadnock Region."

An idea of the surpassing elegance of this scenic portion of New Hampshire can be gleaned from the publication "The Monadnock Region." This book will be mailed together with the Hotel Book for two cents in stamps by the General Passenger Department, Boston & Maine Railroad, Boston.

Willcox & Gibbs Sewing Machine Co. Returning to Its Old Home.

As soon as the new 12 story fire-proof building now being erected on the corner of Broadway and Bond St., New York City, is completed, the Willcox & Gibbs Sewing Machine Co., now in temporary quarters, Nos. 85-87-89 Bleecker Street, will return to its old location where it has done business for 35 years. The new building will be modern in every particular, containing the latest improvements, and it is expected will be ready for occupancy about next February. As the company will occupy a large part of the new building when completed, it will be fully prepared to handle its steadily increasing business. We congratulate the company upon its early return to its old home, which has been known to the public for so many years as the Willcox & Gibbs corner. It is interesting to note that Mr. Parmly, the executive head of the company for 30 years, was born in the old building—which was erected in 1839 by his father, the late Dr. Jahial Parmly.

The showing of the American Thread Company for the past year is better than in the preceding year. In 1902 nothing was paid on common stock, whereas a dividend has been paid this year, the earnings of the company showing increase in profits about $400,000 compared with preceding year.

The Lawrence Association of Loom Fixers is remodeling its building, making the club room more commodious and better arranged. The machinery department is also being remodeled and fitted with electric power. This club is a very flourishing institution, and combines in a most advantageous way, social enjoyment and recreation as well as technical benefit.

Telephones for Mill Economy.

When a manufacturer wishes to talk with his commission house or a customer or give an order or send word to his home, he almost invariably uses the telephone, and yet the same man, when he wishes to speak with his superintendent or foreman, will either go himself and look him up or send some one else and waste his own and the other person's time.

Everyone recognizes that the telephone for outside business is no longer a luxury, but a necessity, but many mill men consider that the installation of a telephone system in their factories is putting on frills and not worth while. This is a great mistake, and the experience of manufacturers who have installed factory systems demonstrates that much time is saved, to say nothing of convenience.

Moreover, a foreman may be called to the 'phone and given instructions without distracting the attention of the workmen, as is apt to be the case when the superintendent or owner goes to the room. The telephone service works both ways, not only can the office call up the department, but the overseer or superintendent wherever he may be in the mill may call up the office without leaving his room or wasting time to get the information he needs. The factory systems are what is called incommunicating. Each person has his own telephone at hand and there are several other stations on the line.

The cost of installation is really very small, and the cost of operation and maintenance is practically nothing.

There are numerous excellent systems in use, among them being that of the Stromberg-Carlson Telephone Mfg. Co., West Jackson Boulevard, Chicago. They are the largest manufacturers in the United States, and perhaps in the world, of this kind of telephone system, and issue a special circular giving prices and special information of value to textile mills.

Industrial Plants.

Ballinger & Perrot, architects and engineers, Chestnut and 12th Sts., Philadelphia, publish a monthly sheet with above title, containing information on the subject of factory buildings, and usually an illustration of some model plant of their own design. It is an interesting publication, and we understand that mill men may have their names put on their mailing list upon request.

The Butler Mills.

A banquet was given July 25th, 1903, at Squirrels Nest, East Wareham, Mass., to commemorate the starting of the Butler Mill of New Bedford. The committee of arrangements were the Messrs. J. Fernley, W. H. Underdown, Louis B. Kerr, William Riley and Herbert Harrison. The affair was a great success, the expense being borne by all the merchants and manufacturers who have helped to equip the mill, many of whom had representatives present. N. B. Kerr, treasurer of the Butler Mill, presided as chairman, and helped in a great measure to the success of the evening. Among others present were Frederick B. Macy, treasurer of the Soule Mill, and Henry J. Ballou, representing Mr. Stephen C. Lowe, agent for the Messrs. Hetherington & Sons, who furnished the machinery for the card and mule rooms of this mill. After the dinner was served there was speech making and a delightful musical programme concluded the evening's entertainment.

The Maine Woolen Overseers' Association will hold its annual meeting at Old Town, Me., August 22. It is a flourishing organization, and its annual meetings are always well attended. Besides the business meeting there is a banquet and other social features.

Stevens Linen Works, Webster, Mass., have contracted for a Green economizer to be erected immediately. The Atlantic Mills, Providence, R. I., are building a large new power plant and have ordered a Green economizer of 2500 H. P. capacity.

South Carolina, Columbia. Ira R. Hayes of this place is reported as interested in project for establishing a cotton mill at Roaring River, to be known as the Olivesta Mills, for weaving damasks.

Recent Textile Patents.

BALING APPARATUS. Cotton. 731,882. John R. Fordyce, Little Rock, Ark.

BUCKLE. Cotton Tie. 733,950. Dudley E. Eddleman, Weatherford, Texas, assignor of seven-twelfths to Ezra A. Frantz and James E. Armstrong, Weatherford, Texas.

CARDING MACHINE. 733,383. Michael J. Gahagan, Saxonville, Mass.

COAT LINING. 733,780. Morris Weber, Brooklyn, N. Y., assignor to Benjamin Bernard, New York, N. Y.

CLOTH FOLDING Machine. 731,905. William H. Howard, Stoughton, Mass.

COMBING MACHINE. 733,043. Herbert Hoyle and Edwin Scarborough, Halifax, England.

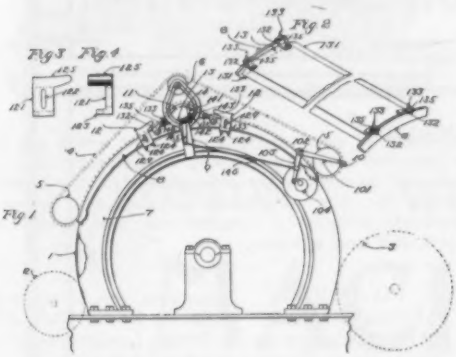
FABRIC STRETCHING Rollers. 731,745. William Birch, Manchester, England.

FIBRE PREPARING Machine. 733,595. Manuel Prieto, Mexico, Mexico.

LOOM. 733,043. John C. Brooks, Paterson, N. J., assignor to Draper Co., Hopedale, Mass.

CARDING ENGINE, Traveling-Flat. 726,496. William Batten & William Hayes, Auburn, Me.

The general object of the invention is to facilitate the production of even and strong yarns when such carding-engines are employed to effect the carding operation, and thereby aid in the making of fine yarns by reason of more thoroughly cleaning the stock. This cleaning is accomplished by taking out a larger proportion of the short fibre and dirt than by other carding-engines of the class in question and by delivering the stock, with its



fibres, straighter and in better parallelism.

This invention consists in general in providing supplemental or additional stripping devices, located at an intermediate point between the licker-in and the doffer, by means of which the flats, after having performed a part of their travel in working relations with the main cylinder, are stripped or cleaned, so that during the remaining portion of their travel upon the flexible bends they are enabled to act as thoroughly and efficiently in carding as after first returning to the cylinder adjacent the licker-in.

LOOM. 733,333. Edward Powell, Frankfort, Ky., assignor to George O. Redpath, Frankfort, Ky.

LOOM. 733,434. Nathaniel M. Shinn, Philadelphia, Pa., assignor to Robert Dornan and Thomas Benton Dornan, Philadelphia, Pa.

LOOM CAM. Bag. 731,655. Henry Bardsley, Providence, R. I., assignor to Crompton & Knowles Loom Works, Worcester, Mass.

LOOM HARNESS. 733,660. Charles Knibbs and R. H. Sterrett, Paterson, N. J.

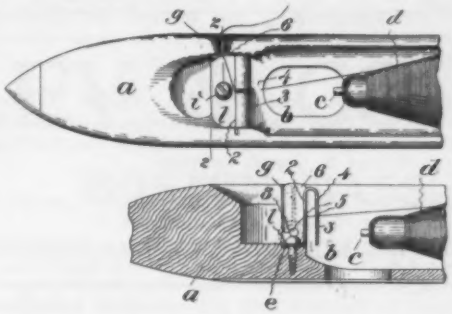
LOOM HARNESS Mechanism. 733,089. Edward S. Stimpson, Hopedale, Mass., assignor to Draper Co., Hopedale, Mass.

LOOM LAPPET. 733,490. Hector Ledoux, Worcester, Mass., assignor to Crompton & Knowles Loom Works, Worcester, Mass.

LOOM SHUTTLE. Self Threading. 728,383. George Fair, Salem, Mass., assignor to Edwin W. Gay, Newton, Mass.

The object of this invention is to provide an attachment for shuttles having delivering-eyes and as a whole, and will also provide a guard for the wall-slit to prevent the warp from entering said slit.

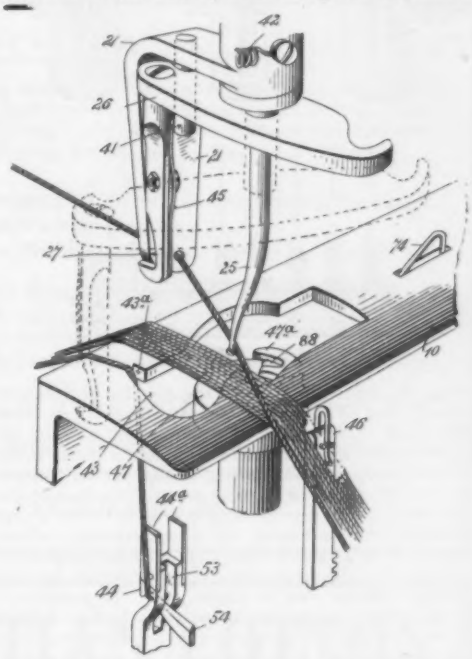
slits leading thereto, which attachment will brace the wall of the shuttle so as to strengthen the latter



PICKER STICK BUNTER. 727,859. George Swift, Oakdale, Mass.

SKEINING MACHINE. 728,775. Joseph H. Shearn, Leeds, Mass.

This invention relates to machines for automatically reeling silk or other filament into skeins, the object being to produce a machine in which the skein may be of any desired length and in which the ends of the thread, after being cut off, are au-



tomatically crossed and given a turn around the skein and then knotted together.

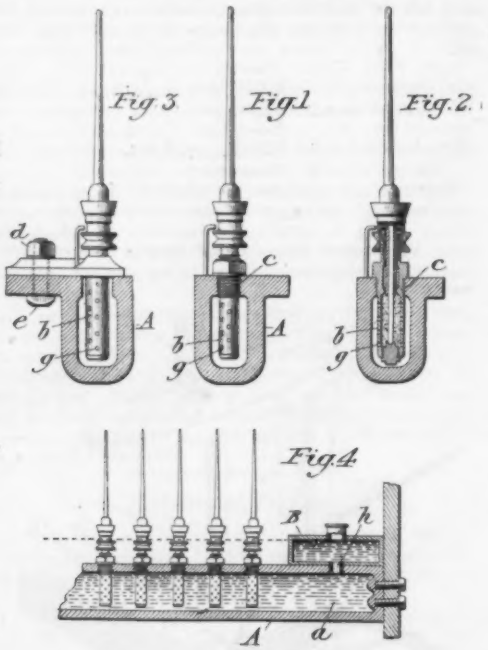
A further object is to provide means for counting the skeins and for arresting the motion of the

machine when a given number of skeins have been wound and tied. It also provides means for subjecting the tied skeins to a stretching action on the reel for straightening the strands and drawing more tightly the looped ends of the skein around the latter.

SKIRTS, Woven Interlining for. 726,648. Walter S. Cox, Philadelphia, Pa., assignor to himself and George S. Cox, Philadelphia, Pa., trading as George S. Cox & Brother.

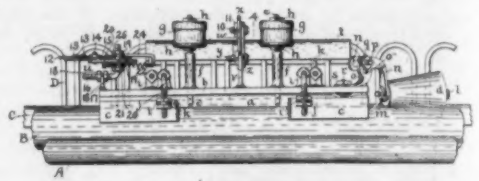
SPINNING FRAME. Bolster Rail. 727,715. Daniel A. Tompkins, Charlotte, N. C.

This invention relates to certain new and useful improvements in bolster-rails for spinning-frames, twisting-frames, and the like. It is designed particularly to dispense with the customary individual lubricating feed-tube heretofore employed for supplying the lubricating oil to the spindle bearings or bolsters, and to substitute therefor a reservoir common to an entire series of spindles and of such capacity as to supply the necessary lubrication to the series without renewal during a long period of time. To this end a hollow casting adapted to receive the lubricating oil and provided, if desired, with a supplemental compartment or compartments whose purpose is to give any head that may be considered desirable by the operator, is substituted for the ordinary bolster rail of angle iron. In practice it will be found convenient to cast the hollow bolster rail in a number of sections whose hollow interiors may communicate with each other by means of connecting nipples, or, if preferred, the sections may be put into communication with each other by means of by-pass pipes located on the rear side of the bolster rail, so as to be out of the way.



SPINNING MACHINE. Roll Cleaner. 727,099. Thomas O. Cunningham, South Hadley Falls, Mass.

The object of this improvement to spinning machines is to provide means for automatically cleaning the upper or gravity roll in an effectual manner without removing it and while the machine is in actual operation, thus insuring a saving in time and expense. It also provides a cleaner which can be so adjusted as to be adapted to different sizes of rolls and to meet other differences and conditions. Besides the above-mentioned advantages it is comparatively simple in construction and operation, practicable and efficient.



SILK FILAMENTS. Apparatus for Producing Artificial. 732,784. Eppa H. Ryon, Waltham, Mass., and Charles N. Waite, Lansdowne, Pa., assignors to General Artificial Silk Co.

SILK REEL. High Speed. 731,765. Edouard Fougeirol. Ollieres, France.

SPINNING MACHINE. 733,299. Ding Cie Sui, Foochow, China, assignor to George S. Miner, Foochow, China, and William N. Brewster, Hing-hua, China.

SPINNING MACHINE Needle Frame. 733,608. Gustave Van Meurs, Ghent, Belgium.

SPINNING MACHINE. Ring. 732,526. Narcisse N. Daudelin, Fall River, Mass.

SPINNING RING. 733,495. A. A. Lovejoy, Lowell, Mass., assignor of one-half to Lucian J. Fosdick, Boston, Mass.

SPINNING SPINDLE. 732,179. Richard Fair, Moosup, Conn., assignor to Draper Co., Hopedale, Mass.

SPINNING SPINDLE. 733,641. William Gihon, Chicopee, Mass.

SPINNING SPINDLE Plumbing Device. 732,223. Alonzo E. Rhoades, Hopedale, Mass., assignor to Draper Co., Hopedale, Mass.

THREAD DRESSING Machine. Twisting Head for. 731,883. George A. Fredenburgh, Pawtucket, R. I.

YARN CHAINS. Unwrapping Mechanism for. 732,439. Samuel Pearce, Holyoke, Mass., assignor to Draper Co., Hopedale, Mass.

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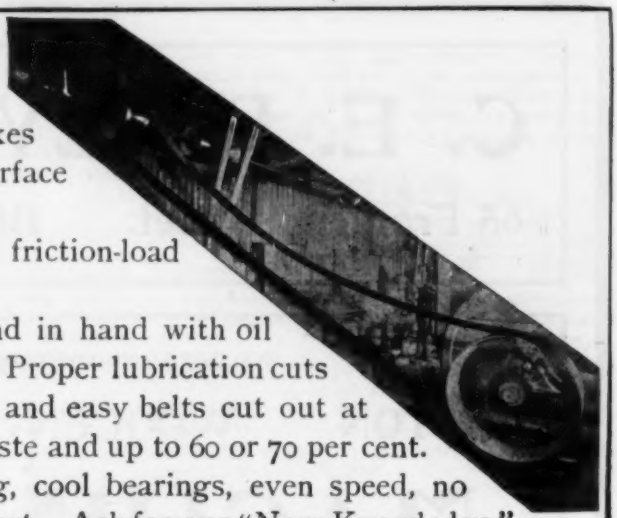

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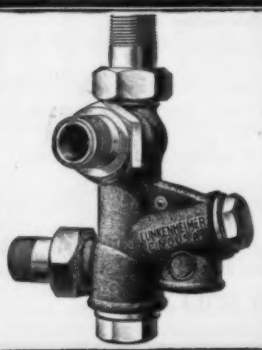

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AUTOMATIC INJECTOR

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Roessler & Hasslacher Chemical Co.

Cling Surface.
Cling Surface Mfg. Co.

Clocks.
Howard, E., Clock Co.
Riggs & Brothers.

Cloth Boards.
Chaffee Bros.

Cloth Stretchers.
Birch Bros. Co. (Somerville Mchn. Works).
Luther, C. A. & Co.

Clutches.
American Tool & Machine Co.
Dodge Mfg. Co.
Hunter, James, Machine Co.
Smith, Jas. Woolen Machinery Co.

Coal.
Crooked Fork Coal & Coke Co.

Combs (Wool and Cotton).
Crabb, William & Co.
Riley, C. E. & Co.
Smith, Jas., Woolen Machinery Co.
Stoddard, Haserick, Richards & Co.
Townsend, Thomas.

Commission Agents.
English-Greene Co.

Conveying Machinery and Chains.
Jeffrey Manufacturing Co.

Cop Tubes.
——See Paper Tubes.

Copper Gaskets.
U. S. Mineral Wool Co.

Copper (Perforated).
——See under Perforated Metal.

Copper Print Rollers.
Taunton, New Bedford Copper Co.

Coppersmiths.
Beer, Paul.
Badger, E. B. & Sons Co.

Copper Work for Dyers.
Butterworth, H. W. & Sons Co.
Textile Finishing Machinery Co.

Cotton.
Blaisdell, Jr., Co., S.
Charles, W. B.
Riley, C. E. & Co.
Stoddard, Haserick, Richards Co.

Cotton Elevators.
Buffalo Forge Co.

Cotton Machinery.
Altemus, Jacob K.
Atherton, A. T., Machine Co.
American Drying Machinery Co.
Ashworth, Elijah.
Brigham, Arthur A.
Brownell, O. L.
Butterworth, H. W. & Sons Co.
Crompton & Knowles Loom Works.
Curtis & Marble Machine Co.
Draper Company.
Easton-Burnham Co.
Entwistle, T. C., Co.
Fairmount Machine Co.
Firth, William, Co.
Houghton, L. T.
Howard & Bullough American Mach. Co.
Kilburn, Lincoln & Co.
Kitson Machine Co.
Leigh, Evan A.
Lever, Oswald.
Lowe, Stephen C.
Lowell Machine Shop.
Mason Machine Works.
Metallic Drawing Roll Co., The.
Philadelphia Drying Machinery Co.
Philadelphia Textile Machinery Co.
Riley, C. E. & Co.
Saco & Pettee Machine Shops.
Schofield, Geo. L.
Smith, Jas., Woolen Machinery Co.
Speed & Stephenson.
Stoddard, Haserick, Richards & Co.
Stubbs, Joseph.
Whitin Machine Works.
Woonsocket Machine & Press Co.

Cotton Openers and Lappers.
Atherton, A. T., Machine Co.
Howard & Bullough American Mach. Co.
Kitson Machine Co.
Riley, C. E. & Co.
Stoddard, Haserick, Richards & Co.

Cotton Softeners.
Bosson & Lane.

Cotton Waste.
Becker, C. W.
Blaisdell, Jr., Co., S.
Charles, W. B.

Crayons.
Lowell Crayon Co.

Cutters for Knit Fabrics.
Adams Rib & Top Cutting Co.
Kennedy, Thos. (Cutters, etc.).
Universal Cutter Co.
Wolf Elec. Promoting Co.

Dating and Time Stamps.
Riggs & Brothers.

Dextrine.
Stein, Hirsh & Co.

Dobbies.
Crompton & Knowles Loom Works.
Stafford, George W. Co., The.

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Metallic Drawing Roll Co., The.

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American Drying Machinery Co.
Arlington Machine Works.
Birch Bros. Co. (Somerville Mchn. Works).
Boston Blower Co.
Buffalo Forge Co.
Butterworth, H. W. & Sons Co.
Hunter, Jas., Machine Co.
Kenyon, D. R. & Son.
Mass. Fan Co.
Philadelphia Drying Machinery Co.
Philadelphia Textile Machinery Co.
Sargent's, C. G., Sons.
Smith, Jas., Woolen Machinery Co.
Somerville Mach. Wks.
Sturtevant, B. F. Co.
Textile Finishing Machinery Co.

Drying Boards.
Bull, William C.

Dusters.
——See Wool and Waste Dusters.

Dust Collectors.
Allington & Curtis Mfg. Co.
Philadelphia Drying Machinery Co.
Philadelphia Textile Machinery Co.

Dyers, Bleachers and Finishers.
Blissville Mills.
Brophy's, T., Sons.
Cold Spring Dyeing & Bleaching Co.
Cooper Mercerizing Co.
Cranston Worsted Mills (yarns).
Davidson, J. F.
Firth & Foster Co.
Greenwood, R. & Bault.
Home Bleach & Dye Works.
Ingrahamville Dye Works.
Lorimers, The Wm. H. & Sons Co.
Molt Bros. (Indigo Blue).
Pawtucket Dyeing & Bleaching Co.
Pennypack Yarn Finishing Co.
Providence Mills Mfg. Co.
Rothe, O. & P., Man. & Supply Co., Ltd.
Rowland, Samuel.
Whittier Mills.
Wild, Chas. E.

Dyeing, Drying, Bleaching and Finishing Machinery.
American Blower Co.
American Drying Machinery Co.
American Yarn Dyeing Machine Co.
Antisdel, E. M. (Knit Dryer).
Arlington Machine Works.
Birch Bros. Co. (Somerville Mchn. Works).
Buffalo Forge Co.
Butterworth, H. W. & Sons Co.
Curtis & Marble Machine Co.
Dubois, A. N.
Entwistle, T. C., Co.
Fabric Measuring & Packaging Co.
Fairmount Machine Co.
Gessner, David.
Haag, A. W., & Co.
Heathcote, John & Son.
Hopkins Machine Works.
Howard Foundry & Mch. Wks.
Kenyon, D. R. & Son.
Klauder-Weldon Dyeing Machine Co.
Knowles, J. W. & Co.
Leyland, Thos. & Co.
Philadelphia Drying Machinery Co.
Philadelphia Textile Machinery Co.
Smith, Drum & Co.
Smith, Jas., Woolen Machinery Co.
Somerville Machine W'ks, Birch Bros. Co.
Sturtevant, B. F. Co. (Drying).
Textile Finishing Machinery Co.

Dye House Cans.
Hill, James, Mfg. Co.

Dye Sticks.
Bailey, Frank.
Haedrich, E. M.

Dyestuffs and Chemicals.
Atteaux, F. E. & Co.
Bailey-Rodgers Co.
Berlin Aniline Works.
Bischoff & Co.
Bosson & Lane.
Cassella Color Co.
Dillon & Co.
Dubois, A. N.
Farbenfabriken of Elberfeld Co.
Ford, J. B., Co.
Fortner, L. B.
Geigy Aniline & Extract Co.
Geisenheimer & Co.
Holliday & Sons, Ltd.
Johnson, Chas. A. & Co.
Kuttroff, Pickhardt & Co.
Leyland, Thos. & Co.
Metz, H. A. & Co.
Molt Bros. (Indigo Blue).
N. Y. & Boston Dyewood Co.
Roessler & Hasslacher Chemical Co.
Selling Co., The.
Sharpless Dye Wood Ext. Co.
Solvay Process Co.
Sykes & Street.
Thayer, Ed. M.
Vila, H. S.
Wild, Charles E.

Dynamos and Motors.
General Electric Co.
Sturtevant Co., B. F.

Edgings.
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Electrical Construction.
General Electric Co.

Electric Fans.
American Blower Co.
Buffalo Forge Co.
General Electric Co.
Mass. Fan Co.
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Sturtevant Co., B. F.

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General Electric Co.

Electric Motors.
General Electric Co.
Sturtevant Co., B. F.

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Whitcomb, H. C. & Co.

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Howard Foundry & Mch. Wks.
Jeffrey Manufacturing Co.
Morse, Williams & Co.
Salem Elevator Works.

Employers Time Recorders.
Riggs & Brothers.

Exhaust Heads.
Burt Manufacturing Co.
Pittsburg Gage & Supply Co.
Sturtevant, B. F., Co.

Fans—Exhaust and Ventilating.
——See Ventilating Apparatus.

Feed Water Heaters.
Green Fuel Economizer Co.
Scaife, W. B. & Sons.

Feed Water Pumps.
Goulds Mfg. Co.
Pittsburgh Gage & Supply Co.
Scaife, W. B. & Sons.

Feeds.
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Filters.
Norwood Engineering Co.
Phila. Water Purification Co., The.
Pittsburgh Gage & Supply Co.
Scaife, W. B. & Sons.

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——See Dyeing, Drying, Bleaching and Finishing.

Fire Brick.
Borgner, Cyrus, Co.

Fire Extinguishers.
Badger, E. B. & Sons Co.

Fire Hose.
Boston Belting Co.

Fire Hydrants.
Norwood Engineering Co.

Flax, Tow, Hemp and Jute Machinery.
Lawson, Samuel & Sons.

Fluted Rolls.
Baker Machine Co.
Riley, C. E. & Co.
Thurston, A. G. & Son.

Flyers.
Baker Machine Co.

Forges.
Buffalo Forge Co.
Sturtevant Co., B. F.

Friction Clutches.
——See Clutches.

Friction Cones.
Evans, G. Frank.

Fuel Economizers.
Green Fuel Economizer Co.

Fulling Mills for Woolen Goods.
Hopkins Machine Works.
Hunt, Rodney, Machine Co.
Hunter, Jas., Machine Co.
Kenyon, D. R. & Son.

Garnetts.
Philadelphia Textile Machinery Co.
Smith, Jas., Woolen Machinery Co.

Gaskets (Copper).
U. S. Mineral Wool Co.

Gas Engines.
Jones, Lewis.

Gas Exhausters.
Sturtevant Co., B. F.

Gaskets (Rubber).
Boston Belting Co.

Gauges.
Crosby Steam Gage & Valve Co.
Lunkenheimer Co.
Pittsburgh Gage & Supply Co.

Gears.
New Process Raw Hide Co.

Gear Cutting Machine.
Whiton, The D. E., Co.

Generating Sets.
Buffalo Forge Co.
Sturtevant Co., B. F.

Glue.
American Glue Co.

Heating.
——See Ventilating.

Heddles.
Smith, Jas., Woolen Machinery Co.
Stoddard, Haserick, Richards & Co.
Watson, L. S., Mfg. Co.

Hose.
Boston Belting Co.

Hosiery Boards.
Pearson, J. T.

Hosiery Labels.
Saranac Electrical Mfg. Co.

Humidifying Apparatus.
American Air Moistening Co.

Hydro Extractors.
American Tool & Machine Co.
Brigham, Arthur A.
Riley, C. E. & Co.
Stoddard, Haserick, Richards & Co.
Textile Finishing Machinery Co.

Injectors.
Lunkenheimer Co.

Interior Telephone System.
Stromberg-Carlson Tel. Mfg. Co.

Ironing Machines for Knit Goods.
Craw, J. W., Laundry Machinery Co.

Jacquard Cards.
Rogers Paper Mfg. Co.

Jacquards.
Halton's, Thomas, Sons.

Knit Goods, Edgings, Trimmings, Etc.
Cathcart, John & Co.
Chapin, Geo. W.
Charles, W. B.
Cheney Bros.
Friedberger Mfg. Co.
Hepner & Horwitz.
Krout & Fite Mfg. Co.
Weimar Bros.

Knit Goods Finishing Machines, Crochet, Etc.
Arnold Sewing Machine Co.
Craw, J. W., Laundry Machinery Co.
Johnson Novelty & Mill Supply Co.
Merrow Machine Co., The.
Nye & Tredick Co.
Scott & Williams.
Union Special Sewing Machine Co.
Willcox & Gibbs Sewing Machine Co.

Knitting Machine Cylinders.
Paxton & O'Neill.
Ruth Automatic Knitting Machine Co.
Stafford & Holt.
Stanton & Lewis.

Knitting Machinery.
Adams, John.
Adams Rib and Top Cutting Mch. Co.
American Knitting Machine Co.
Branson Machine Co.
Brinton, H. & Co.
Champion Machine Co.
Claes & Flentje.
Cooper, Chas.
Crane Mfg. Co.
Excelsior Knitting Machine Mfg. Co.
Hess, J. Calvin.
Jenckes, E., Mfg. Co.
Jones, Lewis.
Kennedy, Thos. (Cutters, etc.).
Keystone Knitting Machine Mfg. Co.
Lamb Knitting Mach. Mfg. Co.
Leighton Machine Co.
Lindley, Geo. W.
Ludwig, E. H.
Mayo Knitting Machine & Needle Co.
McMichael, A.
McMichael & Wildman Mfg. Co.
Mueller, Arthur.
National Automatic Knitter Co.
Nye & Tredick Co.
Paxton & O'Neill.

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DISCHARGED BY A

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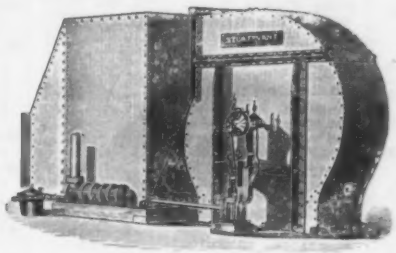
QUICKLY ABSORBS and renders invisible all moisture in the atmosphere of a bleachery or dye house.



IT ABSOLUTELY PREVENTS the formation of steam, keeps the atmosphere clear and increases the output of operatives. The excess of air pressure causes all leakage to be outward.

B. F. STURTEVANT CO.

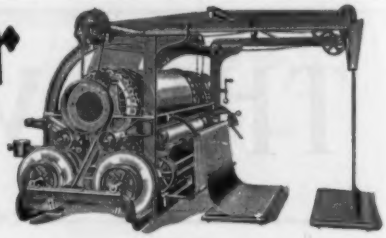
BOSTON, MASS.

New York Chicago Philadelphia London

216

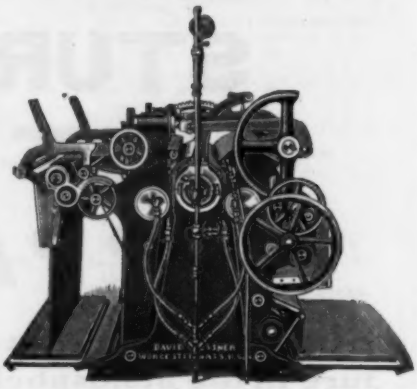
David Gessner

Worcester, Mass.



Latest Improved Cloth Finishing Machinery

Napping Machines and Presses a Specialty



Knitting Machinery—cont.
Pepper Machine Works.
Richter, Wolfgang.
Ruth Automatic Knitting Machine Co.
Scott & Williams.
Seyfert & Donner.
Stafford & Holt.
Standard Machine Co.
Taylor, James.
Tompkins Bros.
Walther, Otto.
Wildt & Co.

Knitting Needles and Supplies.
Breedon's, Wm., Son.
Brinton, H. & Co.
Cooper, Chas.
Corey, Wm., Co.
Crane Mfg. Co.
Dodge Needle Co.
Ives, Loyal T.
Keystone Knitting Machine Mfg. Co.
Lamb Knitting Machine Mfg. Co.
Manufacturers' Supplies Co.
Mayo Knitting Machine & Needle Co.
Page Needle Co.
Ruth Automatic Knitting Machine Co.
Treat, Orion.
Wardwell Needle Co.

Knotter for Spoolers.
Barber & Colman.

Labeling Machine.
P. & G. Novelty Co.
Saranac Electrical Mfg. Co.

Laboratory Outfits.
Feidt, Geo. D. & Co.

Leather.
Houghton, E. F. & Co.

Leather Boards.
Rogers Paper Mfg. Co., Inc.

Lockers.
Narragansett Machine Co.

Loom Forks.
Clegg Weft Fork Co.
Non-Rebounding Loom Fork Co.

Looms.
Asala Co.
Crompton & Knowles Loom Works.
Draper Company.
Fairmount Machine Works.
Howard Fndy. & Mch. Wks. (For Wire).
Kilburn, Lincoln & Co.
Leigh, Evan A.
Lowell Machine Shop.
Mason Machine Works.
Smith, Jas., Woolen Machinery Co.
Stafford, George W. Co., The.
Stoddard, Haserick, Richards & Co.
Whitin Machine Works.

Loopers.
Beattie's Machine Works.
Hepworth, John W. & Co.
Leighton Machine Co.

Lubricators.
Dixon, Jos., Crucible Co.
Lunkenheimer Co.
Pittsburgh Gage & Supply Co.

Lumber.
Stearns, A. T., Lumber Co.

Lumpers.
Gerry, George & Son.

Machinery Dealers.
American Textile Supply Co.
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Pittsburgh Gage & Supply Co.
Schofield, Geo. L.
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Machinists' Tools.
Dodge Mfg. Co.
Whiton, The D. E. Co.

Mails.
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Measuring and Folding Machines.
Curtis & Marble Machine Co.
Elliott & Hall.
Fabric Measuring & Packaging Co.

Mechanical Draft.
American Blower Co.
Boston Blower Co.
Buffalo Forge Co.
Mass. Fan Co.
Sturtevant, B. F., Co.

Mechanical Engineers.
American Blower Co.
Buffalo Forge Co.
Sturtevant Co., B. F.
Suck, Adolph.

Mercantile Agency.
Dun, R. G. & Co.

Mercerisers.
Blissville Mills.
Cooper Mercerizing Co.

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Klauder-Weldon Dyeing Machine Co.
Smith, Drum & Co.
Textile Finishing Machinery Co.

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Mill Supplies.
American Supply Co.
American Textile Supply Co.
Bamford & Smith.
Bristol, The, Co.
Buckley's, Benj. Son, Gun Mill.
Chase Pulley Co.
Crosby Steam Gage and Valve Co.
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Dodge Mfg. Co.
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Jefferson, Ed. & Bro.
Jeffrey Manufacturing Co.
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Keystone Leather Belting Works.
Lane, W. T. & Bro.
Main Belting Co.
Morris & Co.
Pittsburgh Gage & Supply Co.
Putnam & Co.
Riley, C. E. & Co.
Shaw, Victor, Ring Traveler Co.
Smith, Jas., Woolen Machinery Co.
Stephenson Mfg. Co.
Stoddard, Haserick, Richards & Co.
Sweet & Doyle.
Thurston, A. G. & Son.
Ward & Vandegrift.
Walworth Manufacturing Co.
Watson, L. S., Mfg. Co.

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Curtis & Marble Machine Co.
Gessner, David.
Jones, Lewis.
Parks & Woolsen Machinery Co.
Woonsocket Napping Machinery Co.

Noils (Silk).
Malcolm Mills Co.
Kyle, Wm. & Co.

Numbering Machines.
Force, Wm. A., & Co.

Oil Cups.
Lunkenheimer Co.
Pittsburgh Gage & Supply Co.

Oil Filters.
Burt Manufacturing Co.
Pittsburgh Gage & Supply Co.

Oils.
New York & New Jersey Lubricant Co.
Stephenson Mfg. Co.

Oilless Bearings.
Arguto Oilless Bearing Co.

Overhead Trolley Track.
Putnam & Co.

Overseaming Machines.
Arnold Sewing Machine Co.
Champion Machine Co.
Merrow Machine Co.
Union Special Sewing Machine Co.
Willcox & Gibbs Sewing Machine Co.

Oxidizing Machinery.
Dubois, A. N.
Haag, A. W., & Co.

Packing.
Boston Belting Co.

Paint.
Patton Paint Co.
Standard Paint Co.

Painting Machines.
Patton Paint Co.

Pantagraphs for Mill Engraving.
Johnson, C. A., & Co.

Paper Box Machinery.
Langston, Samuel M.

Paper Tubes.
Sayford Paper Specialty Co.

Patent Solicitors.
Crosby & Gregory.
Howson & Howson.
Jacker, R. J.
Siggers & Siggers.
Straley, Hasbrouck & Schloeder.

Perforated Metals.
Beckley, A. J. & Co.

Peroxide of Sodium.
Roessler & Hasslacher Chemical Co.

Pipes and Fittings.
Pancoast, Henry B. & Co.
Walworth Manufacturing Co.

Pneumatic Conveying.
—See Ventilating.

Power Transmission Machinery.
Allis-Chalmers Co.
American Drying Machinery Co.
Chase Pulley Co.
Dodge Mfg. Co.
Evans, G. Frank.
Fairmount Machine Works.
Howard Foundry & Mch. Wks.
Hunter, Jas., Machine Co.
Jeffrey Manufacturing Co.
Kilburn, Lincoln & Co.
Oneida Steel Pulley Co.
Pittsburgh Gage & Supply Co.
Philadelphia Drying Machinery Co.
Saginaw Manufacturing Co.
Sellers, William & Co.
Smith, Jas., Woolen Machinery Co.
Textile Finishing Machinery Co.

Preparatory Machinery (Cotton).
Atherton, A. T., Mach. Co.
Howard & Bullough Am. Machine Co.
Kitson Machine Co.
Riley, C. E. & Co.
Saco & Pettee Machine Shops.
Smith, Jas., Woolen Machinery Co.

Press Boards and Fenders.
Rogers Paper Mfg. Co., Inc.

Pressers.
Baker Machine Co.
Birch Bros. Co. (Somerville Mchn. Works).

Presses.
Boomer & Boschert Press Co.
Butterworth, H. W. & Sons Co.
Curtis & Marble Machine Co.
Gessner, David.
Hart, Charles.
Howard Foundry & Mch. Wks.
Spence & Rideout.
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Woonsocket Machine & Press Co.

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Pumps.
Allis-Chalmers Co.
Goulds Mfg. Co.
Textile Finishing Machinery Co.

Purifying & Filtration Plants.
Scaife, W. B. & Sons.

Rag Pickers.
Smith, Jas., Woolen Machinery Co.

Ramie Tops and Noils.
Tierney, Frank A.

Raw Hide Gears.
New Process Raw Hide Co.

Reed and Harness Manufacturers.
American Supply Co.
Walder, J.

Reels.
Luther, C. A. & Co.

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Feingold, H. & D.

Ribbons.
Cheney Bros.

Ring Travelers.
National Ring Traveler Co.
Shaw, Victor, Ring Traveler Co.

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Standard Paint Co.

Rope and Twine Machinery.
Haskell-Dawes Machine Co., The

Rope Transmissions.
Dodge Mfg. Co.

Roving Cans.
Hill, James, Mfg. Co.
Laminar Fibre Co.
N. E. Ventilating & Heating Co.
Walrus Fibre Mfg. Co.

Rubber Covered Rollers and Goods.
Boston Belting Co.

Rubberoid Roofing.
Standard Paint Co.

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CATCH THE DUST

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Dixon Lubricating Saddle Co.
Scales.
Sweet & Doyle.
Scallop Machines.
Merrow Machine Co.
Schools.
Lowell Textile School.
New Bedford Textile School.
Philadelphia Textile School.
Secondhand Machinery.
——See Mchry. Dealers also classified ads.
Screens (Perforated).
——See under Perforated Metal.
Selling Agents.
——See Commission Merchants.
Separators.
Draper Co., The.
Sewing Machines and Supplies.
American Overstitch Machine Co.
Arlington Machine Works.
Arnold Sewing Machine Co.
Birch Bros. Co. (Somerville Mchn. Works).
Champion Machine Co.
Curtis & Marble Machine Co.
Dinsmore Mfg. Co.
Fales, L. F.
Manufacturers' Supplies Co.
Somerville Machine W'ks, Birch Bros. Co.
Textile Finishing Machinery Co.
Union Special Sewing Machine Co.
Willcox & Gibbs S. M. Co.
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Shearing Machinery.
——See Dyeing, Drying, Bleaching and Finishing.
Sheet Metal Work.
Barney Ventilating Fan Works.
Shell Rolls.
Thurston, A. G. & Son.
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——See Wool Shoddies.
Shuttle Checks.
Victor Shuttle Check Co.
Shuttles.
——See Bobbins, Spools, Shuttles, Etc.
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Birch Bros. Co. (Somerville Mchn. Works).
Butterworth, H. W., Sons Co.
Mason Machine Works.
Stoddard, Haserick, Richards & Co.
Textile Finishing Machinery Co.
Silk Mill Supplies.
Hall, I. A. & Co.
Singe Plates.
Birch Bros. Co. (Somerville Mchn. Works).
Butterworth, H. W., Sons Co.
Taunton, New Bedford Copper Co.
Singeing Machines.
Butterworth, H. W., Sons Co.
Curtis & Marble Machine Co.
Knapp, Charles H.
Somerville Machine W'ks, Birch Bros. Co.
Smith, Drum & Co.
Textile Finishing Machinery Co.
Sizing, Starch and Gums.
Arabol Mfg. Co.
Elwell, Henry A. & Co.
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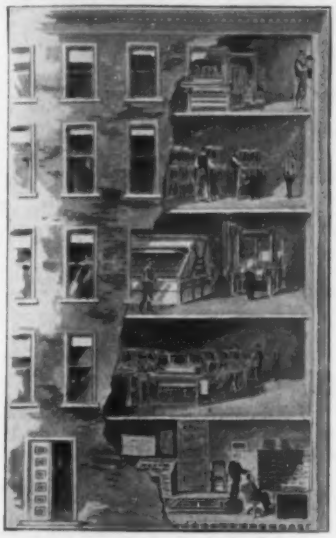

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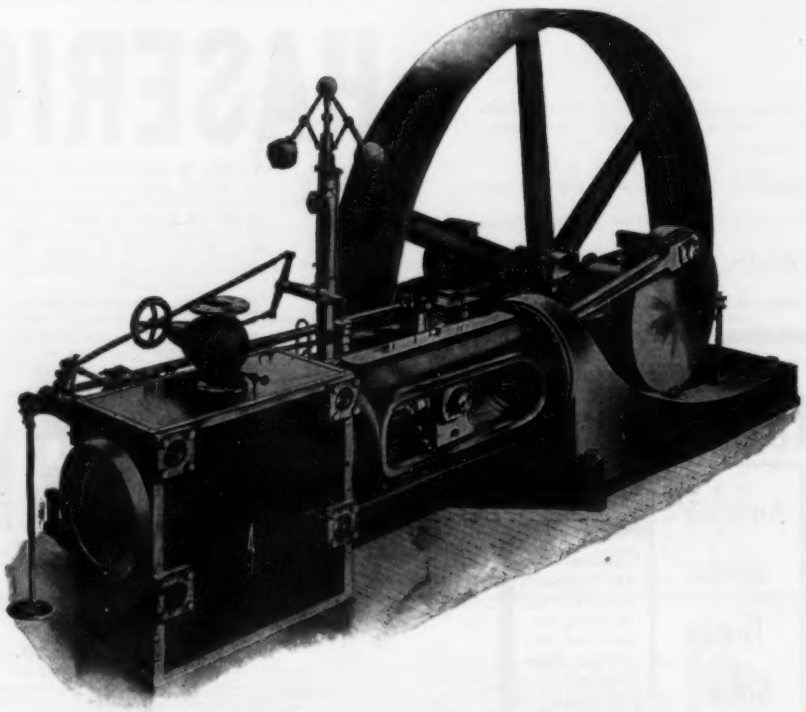

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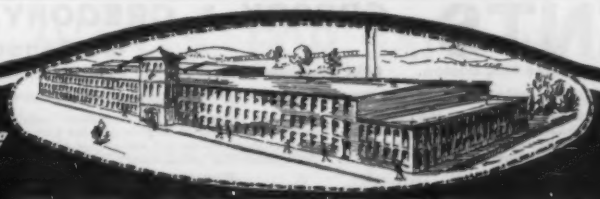

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Manager or Superintendent of a woolen mill, who understands designing, is open to an engagement. 34 years old; Scotch, and single. Large experience in Scotch and Canadian mills on tweeds, worsteds, overcoatings, etc. Good references. 1890, Textile World Record.

Assistant Superintendent or Designer, woolen or worsted, who understands designing and also the work of every department. Has worked on fine worsteds, coverts, cheviots, kerseys, meltons and fancy cassimeres. Technical education acquired at Philadelphia Textile School. Six years' practical experience, three as designer. Age 24; American; good references. Will go anywhere. 1974, Textile World Record.

Superintendent or Designer, an American, married, 38 years of age, is desirous of obtaining a position. Understands the manufacture of worsteds, cotton worsteds, cassimeres, meltons—steam face, flannels, and horse and bed blankets. Long experience and up-to-date in methods. Moderate wage. 1936, Textile World Record.

Superintendent. American; married. Worked on cassimeres, dress goods, cotton warps, and has had some experience on worsteds. Will go anywhere, but would like a good Western mill. Good experience. 3034, Textile World Record.

Superintendent woolen mill. Age 47; English; married. Wants New England or Middle States. 10 years' experience in first-class N. E. mills. 2028, Textile World Record.

Superintendent of Woolen or Worsted Mill, who understands designing, is open to a position. 23 years of age; an American; single. Well recommended, and with good experience. 1891, Textile World Record.

Jute Superintendent

Position wanted by a capable and thoroughly experienced man as manager or superintendent of jute mill. For reference, etc., address FRANCIS A. BEGG, 194 Straight St., Paterson, N. J.

COTTON CARDERS.

Carder in Cotton Mill. Coarse or fine, white or colored, hosiery, Egyptian, etc. Age 35; Canadian; married. 3029, Textile World Record.

Overseer of Carding. Large experience on all kinds of work and both English and American systems. Can furnish first-class references. Had charge of carding in some of the best New England mills. 3009, Textile World Record.

Overseer of Carding. Age 39; married. Worked on coarse and fine numbers and combers. American and English machinery. 3012, Textile World Record.

Overseer of Carding or cotton ring spinning. Worked on carded and combed Peelers, Egyptian, and Sea Island cottons, making yarns from 8 to 80. 3015, Textile World Record.

Overseer Cotton Carding or Spinning desires position. Age 47; American; married. Is familiar with all the modern makes of English and American machinery, revolving top flat cards, single and double carding. 2073, Textile World Record.

Boss Carder. Aged 28. Worked on plain goods. Will go South or anywhere. Steady man, and excellent references. Also a frame spinner. 1759, Textile World Record.

Boss Carder or Ring Spinner and Combing, Cotton hosiery yarns. Will go anywhere. Excellent recommendation. 3025, Textile World Record.

Overseer or Second Hand of Cotton Carding. Age 33; German; married. Hosiery yarns, sheetings, prints, all grades of cotton from waste to Egyptian cotton from 80 to 1600 hank. Not at present employed. Good experience and references. 3026, Textile World Record.

Overseer of Carding or Ring Spinning. Age 35; American. Sheetings, prin ? and yarns, coarse and fine. Worked on most American machinery, but is more familiar with Lowell & Whitin. 1915, Textile World Record.

Carder and Spinner, also twister, spooler and winder. Will go anywhere, but prefers New York state. Age 30; American. Shoddies and cotton mixes, camel hair, noils from 1 to 7 run for weaving or knitting. 2082, Textile World Record.

WOOLEN CARDERS.

Overseer of Woolen Carding, age 32; American; married. Good experience and excellent references. Worked in kerseys, meltons, cheviots, cassimeres, coverts, dress goods, broadcloths, etc. 2060, Textile World Record.

Overseer for Washing, Carding or Combing wool for worsted wants to better himself. Speaks German, French and English. Best of references. 2033, Textile World Record.

Carder, or carder and spinner. Age 49; American. Has worked on all kinds of woolens, and of late on shoddy and cotton mixes. Is familiar with Davis & Furber machines. Excellent reference from past employer. 1944, Textile World Record.

Overseer of Woolen Carding. Age 26; American. Familiar with all American cards. Worked on cotton, wool, shoddy, noils and mixes. Strictly temperate. Will not go West or South. Refers to past employers. 3023, Textile World Record.

Overseer of Carding and Spinning. Middle aged; English; married. Dress goods, flannels, blankets, overcoatings and plush goods. English and American makes of machinery, also an expert on the Bollette condenser. 2079, Textile World Record.

COTTON WEAVERS.

Woolen Boss Weaver. Steady, reliable and an excellent man in a weave room. Has worked on almost all kinds of woolen goods, and is familiar with Crompton & Knowles looms. Will accept position for not less than $2.50 per day. 2088, Textile World Record.

Boss Weaver or Designer, or could fill a position as all around man in a small mill. Age 42; Scotch; married. Worked on fancy cashmeres, blankets, flannels, carriage robes, and other fancy goods. Is familiar with Crompton & Knowles, Davis & Furber, and other looms. Wants to go West or South. 1940, Textile World Record.

Overseer of Weaving or assistant superintendent. Age 33; English; married. Worked on prints, sheetings, colored goods, etc. Prefers New England. Good experience, and first-class references. 3041, Textile World Record.

Overseer of Weaving or designer. Age 29; American; married. Thibets, meltons, kerseys, worsteds and cotton worsteds. Crompton & Knowles looms. Good experience. First class recommendation. 2051, Textile World Record.

Boss Weaver or assistant designer. Wants position with a firm who is willing to advance a man as he proves himself worthy. 28 years old; married, and a steady worker. For past six years worked in all parts of the weave room and pattern room, pattern weaving and dressing, chain building, harness raising, perching, fixing and regular weaving. Now taking course of study in woolen and worsted designing. Excellent reference. 2019, Textile World Record.

Overseer of Weaving, or would take good second hand job. Age 42; married. Worked on dress goods, suitings, plaid backs, cloakings, meltons and other classes of goods. Worked on Crompton & Knowles loom. 3016, Textile World Record.

WOOLEN WEAVERS.

Overseer of Cotton Weaving. Sheetings, sateens and all kinds of fancies from 2 to 24 harness, lenos, lappets and jacquard. Age 32; English and married. 1934, Textile World Record.

Overseer of Cotton Weaving. Age 34; American; married. Fine lawns, sateens, corduroys, crochet goods and all kinds of fancies and lenos. Can take position at once. 2087, Textile World Record.

Boss Weaver, who is familiar with cotton, woolen and worsted looms and all classes of goods, is open to a position in a large mill. 46 years of age; American; married. Strictly temperate and is recommended by some very large N. E. woolen and cotton mills. 1959, Textile World Record.

Overseer of Weaving in cotton mill. Worked on lawns, dimities, sheetings, corduroys, velveteens, etc. Colvin, Mason, Whitin, Kilburn & Lincoln, Knowles and Draper looms. 3011, Textile World Record.

Practical Boss Weaver and loom fixer wants position. Good and long experience. Good record for big production; good quality and for being a good manager of help, and the getting and keeping plenty of good hands. A sober and steady man. Will go anywhere. Either cotton, woolen or jute. 1806, Textile World Record.

Overseer of Weaving. Age 35; Scotch; married. Good experience, and excellent references, Crompton, Whitin, Lowell, Colvin, Woonsocket and English looms. Sheetings, lawns, ginghams, flannels, fine worsteds, dress goods, shirtings and novelty goods. 2016, Textile World Record.

COTTON SPINNERS.

Overseer of Mule Spinning who has had a wide experience in large New England mills on yarns ranging from 24's to 160's is open to a position. 37 years old; American. Good references. 2003, Textile World Record.

Cotton Mule Spinner. Age 42; French; married. Has worked on prints and sheetings and on yarns from 9's to 50's. First class references. Two years' experience as secondhand and five as overseer. Wants $2.50 per day to start with. 1690, Textile World Record.

Secondhand Spinner. Held positions of charge of cone and tube winding and spooling, also section of spinning frames. Cotton yarns 8's to 100's on twisters, spoolers, winders, warpers. 3030, Textile World Record.

Second Hand on Mules. Has had 20 years' experience on cotton mule spinning as mule fixer and second hand. Age 39, with family. Good references. 1950, Textile World Record.

Boss Ring or Mule Spinner. Age 43; English; married. Asa Lee mules, Lowell Machine Shop, Platt, Mason mules; Howard & Bullough, Lowell and Mason frames. Yarns from 5's to 90's. 3001, Textile World Record.

Overseer of Cotton Mule Spinning. Understands Mason and English makes of mules. Has worked in mule room sixteen years, five years as second hand and a year and a half as overseer. 28 years old; married; steady and temperate. Would like to get work in N. E. or New York states. Has worked on colored hosiery yarn and filling. 1822, Textile World Record.

Overseer of Ring Spinning. Aged 42; American; married. Ginghams, sheetings, awnings, denims, etc.; $3 to $4 per day. 3018, Textile World Record.

Overseer Ring Spinning, Warping and Spooling. Is experienced on white work from Nos. 4's to 30's. Is familiar with Whitin and Lowell Machine Shop spinning frames and spoolers and warpers. Wants $3 per day to start with. Age 39; American; married. 1703. Textile World Record.

WOOLEN SPINNERS.

Overseer of woolen spinning desires to make a change. Is familiar with suiting, union, cassimere, satinet and knitting yarns and all ordinary makes of machinery. 30 years of age; American; married. Good references as to character and ability. 1987, Textile World Record.

Overseer Woolen Spinning. Is thoroughly competent to take charge of a large spinning room. 38 years old; French; married. Has spun yarns for flannels, tweeds and knit goods, also cotton and wool mixes, shoddies, ranging in all from 1/2 to 14 runs. Is familiar with Davis & Furber, Johnson & Bassett, Platt and other makes. Very satisfactory references. 1917, Textile World Record.

Worsted Spinner or Section Hand. Age 22 and unmarried. At present employed, but not satisfied with surroundings. Would accept moderate pay. 1709, Textile World Record.

Overseer of Ring or Frame Spinning, or would take superintendent position. Age 41; married. 2040, Textile World Record.

Overseer of woolen spinning desires to make a change. Is familiar with suiting, union, cassimere, satinet and knitting yarns and all ordinary makes of machinery. 30 years of age; American; married. Good references as to character and ability. 1987, Textile World Record.

Boss Spinner. Age 34; Scotch. Worked on all wool, cotton and wool and shoddy mixes. Will not go West, South or to Canada. References. Good experience. 3032, Textile World Record.

DYERS.

Dyer. Second-hand in large house, or boss dyer in small reliable woolen mill. Would accept good offer as chemist to some mill. Age 25; American. Textile graduate, and has held various positions in the laboratory and with dyestuff dealers during past three years. 2097, Textile World Record.

Dyer, Scourer and Bleacher in knitting mill Age 39; married. All grades of underwear, spring and latch needles. First-class recommendations. Will not go West or to Canada. 3004 Textile World Record.

Dyer on cotton and woolen piece goods, yarn and fast black on cotton. Age 42; married. 3021, Textile World Record.

Overseer of Dyeing and Bleaching. Age 38; Scotch, married. Denims, awnings, ticking, outing flannel and madras. First-class references. 3022, Textile World Record.

Boss Dyer and Bleacher. Age 34; English; married. Yarns, warps, knit goods. Can give good references. Wants $4 or more. 3020, Textile World Record.

Expert Hosiery Dyer. Age 27; married and sober. Desires position of superintendent of dyeing in a first-class hosiery mill, one manufacturing high grade goods preferred. Has had over seven years' practical experience in dyeing one of the best aniline blacks on cotton, also fast colors on cotton, wool, silk and union hosiery. Best of references furnished. 2052, Textile World Record.

Cotton Dyer, bleacher or chemist. Age 29. Drills, ducks, sateens, brocades, cotton trowserings, cambric handkerchiefs, sheetings, etc., also printing. Large experience on all classes of cotton goods. 1966, Textile World Record.

Expert Hosiery Dyer. Age 27; best of references; married and sober. Has had practical experience in dyeing one of the best aniline blacks on cotton and fast colors on cotton, wool, union and silk hosiery. Desires position as superintendent of dyeing in a first-class hosiery mill. One manufacturing high grade goods preferred. 2052, Textile World Record.

Overseer of Dyeing and Finishing. Has worked on all kinds of piece dyeing, both cotton and wool, and all kinds of raw stock, dress goods, blankets and fancy cassimeres. Is familiar with Curtis & Marble, Parks & Woolson and Hunter fulling mills. Good references. 2064, Textile World Record.

Dyer of any kind of carpet or rug yarns is open to a position. Been with one firm a number of years. 2037, Textile World Record.

Dyer. Raw stock, chain, warp and skein work. Would like a position in North Carolina, but will go anywhere. Married; American. Good references. Address 973, Textile World Record.

Dyer and Bleacher. Fast colors on cotton, also common colors, one dip warp and skein. Age 38. Married. Excellent references. 1954, Textile World Record.

Boss Dyer. Cotton warps, skein and raw stock used in cottonades, domets, flannelettes, gingham, shirtings and indigo blue denim. Good experience. Age 38. Scotch. Married. 850, Textile World Record.

Boss Dyer. Has a practical knowledge of the combination of colors and shades and has matched to shade. Steady, sober and industrious. Underwear, piece dyes and raw stock, mercerized goods, wool and cotton. 1513, Textile World Record.

Cotton Dyer, bleacher or chemist. Age 30. Drills, ducks, sateens, brocades, cotton trowserings, cambric handkerchiefs, sheetings, etc., also printing. Large experience on all classes of cotton goods. 1966, Textile World Record.

FINISHERS.

Finisher of Cotton Goods, also worsteds, by calender, hot press and beetle, also understands frames, starching and mercerizing. Age 25; English. 3006, Textile World Record.

Finisher, both wet and dry. Age 28; English; married. Shirtings, ginghams, cotton dress goods, mercerized effects and men's cotton suitings and trouserings. Excellent references. 3007, Textile World Record.

Cotton Finisher. Age 27. Worked on prints, lawns, dimities, muslins, ducks, drills, Madras, etc. Understands folding and packing. 3005, Textile World Record.

Overseer of Finishing, worsted goods, white or fancy. A young man; married; English. Has had full charge of piece dye finishing. 3019, Textile World Record.

Overseer of Finishing. Prefers a satinet mill. Eight years' experience as overseer. Aged 47. 3017, Textile World Record.

Overseer of Warping, Spooling and Winding. Dress goods and cloth. Will not go to Canada. Aged 40; married. Good experience. References. 3027, Textile World Record.

Boss Finisher. Would take good secondhand or wet finishing job. Age 41; English. All kinds of woolen and worsted goods, both steam and dry finish. Willing to go anywhere. Both English and American makes of machinery. Excellent references. 2061, Textile World Record.

Overseer of Finishing. Age 32; American. Woolen and worsteds, suitings, coatings, cloakings, cassimeres, cheviots, meltons, frieze, etc. 2070, Textile World Record.

Boss Woolen Finisher. English; married. Indigo blues, broadcloths, doeskins, meltons, cheviots, coverts, overcoatings and fancy cassimeres. Good experience and excellent references. 1613, Textile World Record.

Finisher on worsteds, cassimeres, flannels, dress goods, cloakings, etc. Middle aged man. Long experience as overseer. First-class recommendations. 1911, Textile World Record.

Woolen Finisher. First-class. Familiar with all classes of goods and machinery. Can take full charge from loom to case. Has always been very successful. 1244, Textile World Record.

Boss Finisher of underwear, cotton or wool mixed goods, who understands Wheeler & Wilson buttonhole machines, Union Button, Union Special, etc., is open to a position in the New England or Middle States. 30 years; American; married. Been employed for a number of years by concern for whom he is now working. Exceptionally good references. 1958, Textile World Record.

Foreman of Finishing room, folding, packing, etc. Age 49; married; American. Has had over 12 years' experience as foreman on white goods in one of the largest bleacheries in the country. First-class manager of help and capable of getting good results. 1870, Textile World Record.

A Good Second-hand Finisher who thoroughly understands Union cassimeres, meltons and satinets, would like a position. 30 years of age, American, married. Well up on all well-known makes of machinery, and capable of taking a boss job. Good references. Reasonable wages expected. 1970, Textile World Record.

Overseer Finishing from loom to case. Fine worsteds, cotton worsteds, cheviots, cassimeres, meltons, cotton and shoddy mixed. All kinds of face finished goods and piece dyes. Will not go West. Age 44. Married. American. Good experience. 1748, Textile World Record.

KNITTERS.

Foreman Latch Needle knitter, or fixer with good chance of promotion. Men's and women's underwear, cotton, worsted and silk. Worked on Scott & Williams, McMichael & Wildman, Stafford & Holt, Snyder & Fisher and the Fisher fleece machines. Recommendations. 3000, Textile World Record.

Foreman Knitter in underwear mill. Age 30; American. Familiar with Campbell & Clute, Tompkins, Scott & Williams and Cooper machines. 3038, Textile World Record.

Knitter. Worked on light and heavy weight ladies' ribbed vests and shaped vests, and all kinds of common knit goods. Familiar with Champion, Nye & Tredick, Star, McMichael & Wildman machines. Wants work in Pennsylvania or Western States. 3037, Textile World Record.

Boss Knitter. finisher or machinist. Worked on nearly all kinds of knit goods, and nearly all kinds of latch needle knitting machines and all kinds of machines used in finishing underwear. 889, Textile World Record.

Overseer Boarding and finishing hosiery. All kinds of men's, women's and children's hosiery, except silk. Age 41; American; married. Can furnish references. 3035, Textile World Record.

Superintendent Hosiery Mill. Age 22; American; single. Worked on 84 needle goods. Prefers position in the South. 3033, Textile World Record.

Foreman or Second Hand of Knitting Room. Married; 30 years old. Nine years' experience on hosiery and some on underwear. Familiar with several different makes of full automatic hosiery machines, including Mayo, Standard, Victor, Scott & Williams. Wants a place where he will have steady work. Worked on wool, cotton and lisle. 2093, Textile World Record.

Machinist on Leighton circular machines. Worked on sweaters and jacket. 2026, Textile World Record.

Superintendent knitting mill. Cotton and wool hosiery, heavy mittens, sweaters, toques. Good experience. Aged 45; married. 1291, Textile World Record.

Overseer of Knitting. Ladies' and infants' underwear. Good experience. 1777, Textile World Record.

Overseer of Carding and Spinning. Worked on dress goods, flannels, blankets, overcoatings, plush goods. Good and long experience. Wants position at once. Steady man. 2079, Textile World Record.

Asst. Superintendent or Boss Knitter. Age 29, strictly temperate and held position of boss knitter for past four years running. Fleeces, balbriggan and flat work on spring needles, and plaited, straight and shaped work on several makes of latch needles. Can give best of references. 1492, Textile World Record

Overseer on Spring Needle circular knitting machines wants position. An ingenious, energetic and progressive man, who has spent his life in one of the largest and best equipped knitting mills in country. Particularly good on fine jerseys, stockinets, fleeces, eiderdowns, rubber linings, dress shields, blankets, slipper cloth, etc. 2094, Textile World Record.

Foreman of Knitting Room, spring needle or flat knitting. Age 28. Fleeces of all kinds and gauges, balbriggan from 20 to 30 gauge, flat wool work all gauges. Is familiar with Tompkins Bros., Campbell & Clute and Crane machines. 2062, Textile World Record.

Cuff Knitter and Fixer. Wants a place where he will have steady work. 1951, Textile World Record.

DESIGNERS.

Designer in small mill or assistant in large mill. Age 22; Scotch; single. Has worked on fancy cassimeres, plaid backs, coverts, unions, worsted trouserings and shirtings. Fair knowledge of Jacquard designing. Johnson & Bassett mules, Davis & Furber dresser, and Knowles looms. Is willing to work for moderate salary, with chance of promotion. 1837, Textile World Record.

Smart Designer, high class worsteds and coatings and trouserings. Thorough experience leading factory. Now abroad; anxious to find employment in this country. Moderate start. 1816, Textile World Record.

Assistant Designer on woolen or worsted dress goods and suitings is open to a position. Age 21; American; single. A graduate of one of the largest textile schools in the country, and has had experience in a good New England mill. Also understands flannels and satinets. Good references. 1923, Textile World Record.

Designer or Assistant Superintendent desires a position. 27 years old; Scotch; married. Familiar with all well known makes of machinery and with woolen, worsted and cotton goods. Good references. Will go to any part of the United States. Terms reasonable. 1996, Textile World Record.

A Young Man, 23 years of age, English, would like a position as assistant designer or boss weaver. Has worked on woolen dress goods, cloakings, suitings and worsted suitings. Good references. Moderate wages. Three weavers in family. 1997, Textile World Record.

Designer, or assistant designer. Unions, flannels, tweeds, beavers, serges and worsteds. Age 28; English; married. Can furnish first-class references. 3031, Textile World Record.

Designer. Plain satin, fancy leno, checks, colored and dainties in cotton. Wants $3.50 or over a day. 3043, Textile World Record.

Designer, or assistant superintendent and designer. An A1 color designer. Can get up good line of fancy woolen and worsted goods which will be good sellers and profitable to the manufacturer. Graduate of a prominent designing and textile school in Germany. Is well posted on all kinds of stock, cotton and shoddy, and with the general work of a woolen mill. 1789, Textile World Record.

Designer, or assistant superintendent. Has attended the textile school in Germany. Good experience in every part of business, in dress goods and men's cloth. Has worked in the finishing and dyeing room. Full experience in all kinds of Jacquard designing. 2085, Textile World Record.

A Young Man, 28 years of age, competent to handle the designing for a cotton or silk mill, would like a position. Has made in cotton, plain, fancy and leno; in silk, tie silks, dress goods and linings. Looms, all well-known makes. Is Scotch, and single. 14 years' experience in weave room and designing room. Good references from N. J. and Conn. mills. Four workers in family—weavers. 1897, Textile World Record.

Designer or Designer and Superintendent. Fancy cassimeres of every description, men's wear in general, also fancy cloakings, golf goods, coverts, dress goods, both piece dyed and fancy, kerseys, etc. Aged 42; married; American. 1250, Textile World Record.

A First-Class Designer or superintendent desires position. Understands vestings, dress goods, silk labels, shoe facings, shoe straps, shirt labels and tapes of all descriptions. Large experience on Jacquard work. Age 26; single; English. Strictly temperate. 1773, Textile World Record.

MISCELLANEOUS.

Loom Fixer. Age 27. Knowles and Crompton looms. Wants not less than $2.25 per day. Will not go West or to Southern States. 3014, Textile World Record.

Overseer of Spooling, warping, beaming, slashing and web drawing. Age 37; married. 3010, Textile World Record.

Spare Hand Loom Fixer. Wants place where he can settle down. Is familiar with Crompton & Knowles looms. Age 40. 2091, Textile World Record.

Master Mechanic in cotton mill. Wants $1,500 to $2,500 per year, according to duties and position. Can take place at once. Will not go to Western States or Canada. Familiar with steam engines, pumps, boilers, water wheels and complete cotton mill equipment. 3039, Textile World Record.

Colorist and color mixer for all kinds of printing. Also understands plush printing and extract work. 10 years' experience. Can give references. 2045, Textile World Record.

Master Mechanic wishes position in the North. 35 years old; married. Worked 15 years on repairs. Wants $3.50 per day. Has license for running engines and boilers. Understands all kinds of water wheels and care of same, dynamos and electric lights and also gas houses, and a good knowledge of building, all kinds of wood work and piping and blacksmithing. Understands cotton mill repairs as good as the best man at such work. 2025, Textile World Record.

An Expert on soap making and wool scouring will be open to a position shortly. Is familiar with the treatment of all grades. About 40 years old; English; married. Has worked for one concern in the United States for 12 years. 1980, Textile World Record.

Paymaster or Bookkeeper. Agent or Manager wood or iron working plant or small cotton mill. 23 years' experience. Expert accountant. Can take charge of all the office work in large factory or do all myself in small factory. Good references. Will go anywhere in New England or Middle States. 1881, Textile World Record.

A Second-class Engineer, 48 years of age, American, would like a position as such in a N. E. mill. Is steady and reliable. Good references from former employers. 1965, Textile World Record.

A Young Man who thoroughly understands the keeping of mill books would like a position in the Southern States or would go to Cuba or Puerto Rico. Is a first-class man and perfectly familiar with general office work. An American; 22 years of age; single. Steady and reliable, and can give good references. 1914, Textile World Record.

Overseer of Cone Winding and spooling or ring spinning, who understands Universal, Foster, Broadbent and Payne winders, and Whitin and Mason frames, desires a position. Has worked on carded and combed yarns from 4's to 160's; also, mercerized, gassed and bleached yarns from 2 to 8 ply. Young man; American; married, and can give satisfactory references from large mills. 1960, Textile World Record.

Paymaster and Cashier with 10 years' experience, wants position. Good references and can give bond if required. 1877, Textile World Record.

Overseer Colored Cloth Room. Age 48; American. 25 years' experience as secondhand. 1765, Textile World Record.

Asst. Superintendent. Young man, 26, graduate of Lowell Textile School (Woolen and Worsted Course). Has had considerable experience in setting up machinery, and worked in nearly every department of mill. Wants position in which there is a good chance to advance. 3040, Textile World Record.

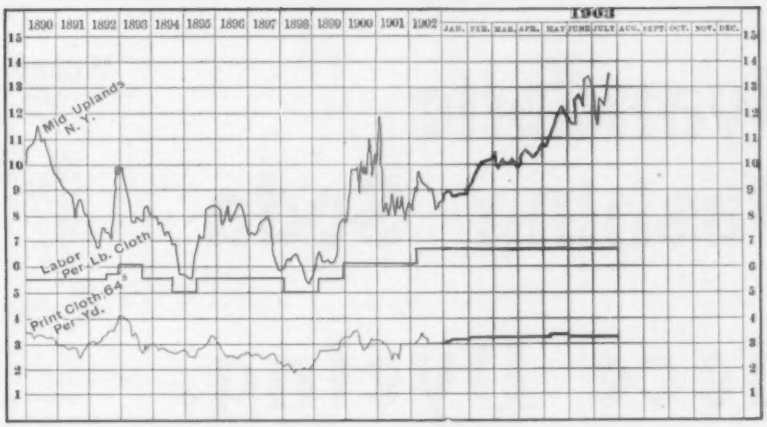
1890 1891 1892 1893 1894 1895 1896 1897 1898 1899 1900 1901 1902
1903
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CHART SHOWING RANGE IN THE PRICE OF COTTON TO DATE.

The Cotton Market.

From the manufacturer's and merchant's standpoints the cotton market has continued in a disorganized condition, pushed up and down by bulls and bears on the cotton exchanges. The high level of the previous month has been more than maintained and it is becoming more evident as time passes that the recent rise and continued strength of the market is due to something more than manipulation by speculators. In spite of the high prices prevailing the world's visible stock of cotton continues small. This is conclusive evidence that the cotton is not in existence. With middling uplands selling at 13 to 13 1/2 cents per pound the world's visible stock, as estimated by the Chronicle, was 1,786,664 bales on July 24, 1903, as compared with 1,911,570 bales on same date last year, 2,276,521 bales in 1901, and 1,367,721 bales in 1900.

There has been a general restriction of consumption by the closing of mills in this country, England and on the Continent. This has had no apparent effect on the market for raw material and sufficient time has not yet elapsed for it to affect the balance of supply and demand.

The stopping of cotton mills is generally looked upon as a stopping of consumption of cotton. In reality, however, this is not the case. The real consumption of cotton is the wearing out of the goods and as far as can be learned this is going on at an undiminished rate. General business continues good in this country and the chronic state of depression in Europe has not increased recently. Our people are busy and prosperous. All who are able and willing to be are employed at fair wages, and, as usual, are spending a large proportion of their earnings for the necessaries of life, among which cotton goods form a large and indispensable part. Until such use of cotton slackens there will be no real restriction of consumption.

Lessening the purchase of cotton at the spinning mills, of cotton yarn at the weaving mills, of cotton goods by either jobber or retailer, does not increase the great stock of cotton products as long as the soil produces no more and the people use no less. An increase of stock at any point, due to such lessening of purchases, is certain to cause a corresponding decrease in the stock at points farther down the stream. Likewise a fall in prices at one point due to such restriction of purchases will be offset by a rise in the price of other and more advanced forms of cotton materials. When spinning mills stop buying cotton; weaving and knitting mills stop buying cotton yarn; jobbers and retailers stop buying cotton goods, it should be remembered that such restriction of business does not affect the production and consumption of cotton, consequently until more raw cotton is grown and less cotton goods worn out we are not likely to see a return to the low level of prices of recent years.

C. M. BLAISDELL, Pres. and Treas. G. A. BLAISDELL, Vice-Pres. and Sec'y.
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COTTON, EGYPTIAN PERUVIAN
American Long Staple a Specialty. Shipments direct to mill from Egypt, Peru and all American Southern Points.
CHICOPEE, MASS.
Cotton Waste Purchased on Yearly Contract from Mills.

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COHOES, N. Y.
WM. BARNETT, Representative, 730-32 S. Broad St., Phila.
Established 1861. Reorganized and Incorporated 1888.

Wyandotte Washing Soda

.. FOR ..

Piece Dyeing.

Do you wish to eliminate the "streaks" so troublesome in piece dyeing?

Do you wish to eliminate the necessity of marking the goods "seconds" on account of not being able to use them because of the "streaks?"

Then use Wyandotte Washing Soda.

Wyandotte Washing Soda imparts to the cloth that peculiar finished condition which gives distinction and character to your output.

Wyandotte Washing Soda prepares the wool so that it takes the dye uniformly and evenly, giving no trouble from streaks and at the same time imparting a brighter finish and a faster color.

Mill men need not take our unsupported testimony for these facts. The unprejudiced result of test proves them. Proves Wyandotte Washing Soda to be a superior article.

We will gladly mail to any interested mill, upon request, a number of testimonial letters from some of the largest mills in United States and Canada that do this class of work with Wyandotte Washing Soda, and who know its great value.

The Time to Buy a Thing is When You Need It.

The J. B. Ford Co.,

Sole Mfrs. **WYANDOTTE, MICH.**

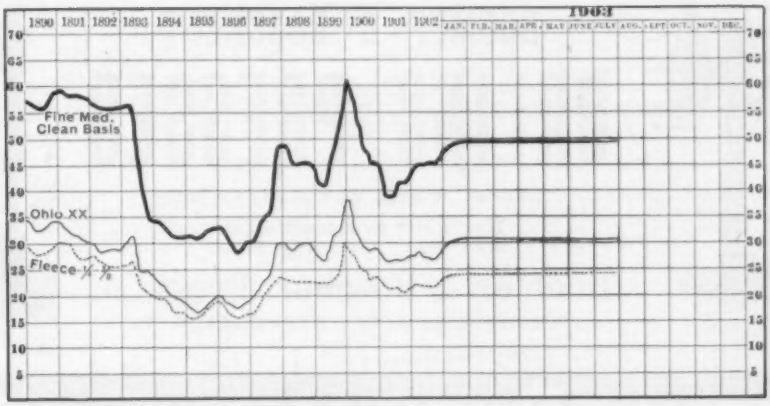

1890 1891 1892 1893 1894 1895 1896 1897 1898 1899 1900 1901 1902
1903
JAN. FEB. MAR. APR. MAY JUNE JULY AUG. SEPT. OCT. NOV. DEC.
Fine Med. Clean Basis
Ohio XX
Fleece ½ ⅝

CHART SHOWING RANGES IN THE PRICE OF WOOL TO DATE.

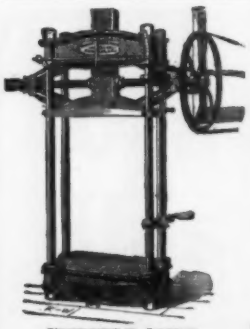
The Wool Market.

The new clip has to a large extent been transferred to East and as a consequence prices have been firm although no material advance has occurred. The owners of wool at the present time are those who have recently purchased it at current quotations with the expectation of selling at a profit. This condition accounts in great measure for the present strong tone of the market. The domestic supply of wool, if not short as claimed, has certainly not been increased this year and the tariff still offers a strong barrier to an increase of the supply from foreign sources. Conditions at the consuming end of the line do not, however, tend in the same direction. Many mills are running slack owing to their inability to secure business. This is reflected in the prices for light weight staple goods, which at the opening showed a decline over last year. Since then the Gilbert line of serges has been reduced from 5 to 7 1/2 cents per yard, bringing it below the prices made by the American Woolen Co. This reduction to secure business with which to ensure a full production from the looms and consequent minimum cost of production has been a shock to the smaller manufacturers, just as such reductions in previous years have shocked them. Doubtless the experience of previous years will be repeated. The smaller and financially weaker manufacturers will raise the cry that goods can not be made for such prices, while the larger, wealthier and more enterprising mill owners will sell their entire production and thus reduce their cost much farther below the cost level of their competitors than their selling prices are below the prices of the same competitors. Such success in marketing the production of a few large mills does not conceal, it rather makes more evident the lessening of the general demand for goods, and it is this which in the long run will affect the price of wool, regardless of the artificial strength given to the market by the more or less complete cornering of the supply by Eastern wool dealers.

The movement of wool has been large and manufacturers have purchased liberally from the new clip which offers a much better selection than will be the case later in the year.

THEODORE JUSTICE. HENRY JUSTICE.
JUSTICE, BATEMAN & CO.
Wool Commission Merchants,
122 South Front St., PHILADELPHIA.

Standard Quality Combed Ramie Top and Noils a Specialty
SOLE AGENT
FRANK A. TIERNEY
Fine Medium and Coarse Wool Tops. Mohair Tops. Camels Hair Tops
RamieYarns for all purposes in all numbers.
Wools, Tops, Noils.
Fine Medium and Coarse Wool Noils. Camel Hair Noils. Silk Noils.
Room 203, Wool Exchange Bldg.
260 West Broadway, New York



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BOOMER & BOSCHERT

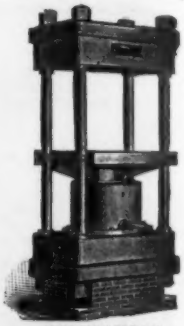
BALING PRESSES

ARE THE STANDARD

Hydraulic or Knuckle Joint
Any Size .. Any Power

Boomer & Boschert Press Co.

338 West Water St., SYRACUSE, N. Y.



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EASTON AND BURNHAM MACHINE CO.,

Pawtucket, R.I.

ALL KINDS OF Spindles USED IN THE MANUFACTURE OF COTTON, WOOL & SILK

IMPROVED UPRIGHT SPOOLERS

TO SPOOL FROM COP, SKEIN, OR BOBBIN.

WEIMAR BROS.

MANUFACTURERS OF

Cotton Mercerized Tapes,

SPOOL TAPES, BINDINGS AND NARROW FABRICS FOR UNDERWEAR AND OTHER TRADES.

Phone Connections. Works, 2046-48 Amber Street, PHILADELPHIA, PA.

KROUT & FITE MANUFACTURING CO.,

Manufacturers of

Silk, Cotton and Mercerized Narrow Fabrics

Spool Tapes a Specialty.

Telephone Connection. Office and Mill, Allegheny Ave. and Emerald St., PHILADELPHIA.

Your Safety Depends on the Efficiency and Strength of Your Valve.
BETTER BE SAFE THAN SORRY.

Water-Relief Valve.

BUY CROSBY STEAM APPLIANCES WHICH ARE RELIABLE

WRITE FOR CATALOGUE.
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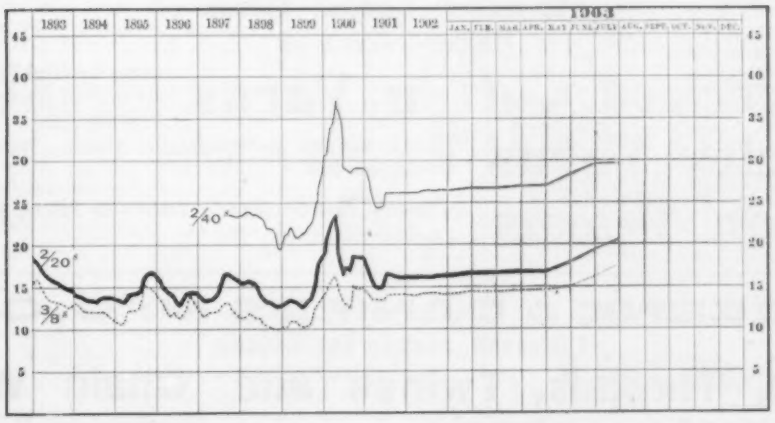
CROSBY STEAM GAGE AND VALVE CO.

Stores, BOSTON, NEW YORK, CHICAGO, LONDON. Office and Works, BOSTON, MASS.

Yarn Department.



GRAPHIC CHART SHOWING RANGE OF PRICE OF COTTON YARN TO DATE.

The Cotton Yarn Market.

The rise in the price of raw cotton and the restriction of the production of yarn by many spinners have been powerful factors in keeping the cotton yarn market at a high level. The volume of business has been small. The manufacturers and dealers in cotton cloths and knit goods are not yet convinced that the rise in cotton marks the beginning of an era of higher level for all cotton products. To a certain extent this doubt may be well founded. Thirteen and one-half cents may not mark the average level that is to prevail, but there are good reasons for believing that this average will be nearer to thirteen and one-half than to the eight cent level of recent years.

The strike in Philadelphia and the stopping of weaving and knitting mills in many parts of the country have materially lessened the demand for yarn without, however, causing any decline in prices. A cheerful tone prevails throughout the yarn trade and it is the general belief that a good business will be done as soon as the trade in manufactured goods becomes adjusted to the new conditions caused by the advance in raw cotton. It is certain that this advance, if maintained, will cause a corresponding advance in the price of cotton goods, a result that cannot fail to be of benefit to the yarn market. In the meantime it is a waiting market and until the situation becomes clearer it is idle for anyone to attempt to sum it up. We quote as follows:

Eastern Cops.

6's	20¾
8's	21
10's	21¼
14's	22¼
16's	22¾
22's	24½
24's	25½
26's	26¼
30's	28¼
34's	28¾
36's	29¾
40's	31¾

On cones, ¾c. more up to 14's; 1c. more from 15's to 22's; 1½c. from 23's to 35's, and 2c. above that.

Eastern Two-Ply Skeins, Carded Peeler.

12's	20½-21
14's	21-21½
18's	23-23½
20's	24
22's	24½
26's	25
28's	26
30's	27
36's	29
40's	31
45's	33
50's	36
55's	39
60's	46

Eastern Two-Ply Warps, Carded Peeler.

2/30's	27-28
2/36's	29-30
2/40's	32-33
2/45's	34-35
2/50's	37-38
2/60's	45-46

Egyptian Weaving Yarns.
Single Skeins Combed.

30's	36-37
35's	37-38
40's	40-41
45's	43-44
50's	48-49
55's	52-53
60's	53-54
70's	62

Two and Three Ply Skeins, Combed.

30's	39-40
36's	42-43
40's	43-44
45's	45-46
50's	51-52
55's	53-54
60's	55-56
70's	63-64

THE J. R. MONTGOMERY CO.,

Windsor Locks, Conn.

MANUFACTURERS OF

Mercerized Cotton Yarns Gives the High Silk-Like Lustre in Knit Goods and Woven Fabrics.

Novelty Yarns Boucle, Bourette and Spirals, in Cotton, Wool, Worsted, Mohair and Silk.

Cotton Warps on Beams, Jack Spools and Tubes. In Fancy, Twist, Colors and Printed.

GREENE & DANIELS MFG. CO.,

COMBED, CARDED AND GASSED

Yarns, Threads, Twines and Chain Warps,

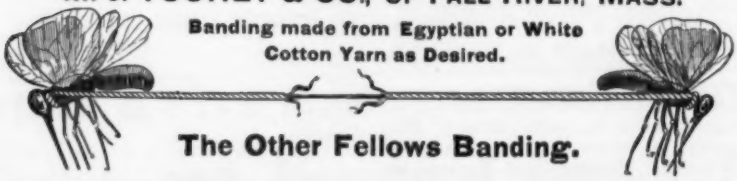
Colored and Bleached Yarns Furnished in any manner desired by the trade.

Pawtucket, R. I.

THESE MULES CANNOT BREAK THE BANDING —MADE BY—

M. J. TOOHEY & CO., OF FALL RIVER, MASS.

Banding made from Egyptian or White Cotton Yarn as Desired.



The Other Fellows Banding.

MONUMENT MILLS,

Manufacturers of

White, Colored, Fancy and Double Twist

COTTON WARPS

HOUSATONIC, MASS.

4s to 60s.

Dana Warp Mills

WESTBROOK, ... MAINE

White and Colored Warps 6s to 50s Single and Ply

Mule Cops From 30s to 50s from American & Egyptian Cotton

The Philadelphia Yarn Market.

The yarn market is on a very high level, and the consumption has been curtailed very materially. Customers are buying very sparingly for prompt delivery. They have been holding off for the past two months, expecting a decline. This has not yet appeared in any marked degree, and probably will not as long as spinners have to depend on the old crop of cotton for spinning.

The strike in Philadelphia is still on, but there are more mills running now than a month ago. Some have made concessions to the strikers, others have compromised with them. The production of yarns in the Southern mills has been curtailed to a considerable extent, and this has helped very materially to maintain the prices on yarn.

There is considerable demand for yarn for fall delivery, and the outlook for trade is good. Yarns will not rule nearly as low this fall, as they did a year ago. This will necessitate an advance in manufactured products, and in the hosiery and underwear lines. Orders have already been received by knitters at prices based on the present value of yarn. We quote as follows:

Southern frame cones (good quality):—

7's and coarser	19
8's and 9's	19-19½
10's	19½-20
12's	20-20½
14's	20½-21
16's	21¼-21½
18's	21½
20's	22
22's	22½
24's	23
26's	23½
30's	25
40's	29
50's	36

Southern high grade mule yarn:—

Cones.

10's	21
12's	21½
14's	22
16's	22½
18's	23
20's and 22's	23½-24
24's	25

Southern frame yarn, lower grades:—

6's and 8's	18-18½
10's	19-19½

Eastern cones (high grade quality):—

10's	21½-22½
12's	22½-23
14's	23-23½
16's	23½-24
18's	24-24½
20's and 22's	24½-25½

Lower grades Eastern yarn:—

6's and 8's	18½-19
10's	20

Rise ¼c. per number to 16's.

Skein yarn (mostly Southern):—

4's to 8's soft	18-19
10's to 12's	18½-19
14's to 20's	19½-21

BUCKINGHAM, PAULSON & CO.
Commission Merchants
COTTON YARNS of all Descriptions
83 LEONARD STREET, .·. NEW YORK
302 Chestnut St., Phila. 210 Munroe St., Chicago, Ill.
Cash Advances, Cash Sales and Prompt Returns. Consignments and correspondence solicited.

JAMES E. MITCHELL & CO., COMMISSION MERCHANTS.
Cotton Yarns
FOR ALL PURPOSES.
122-124 Chestnut Street, PHILADELPHIA, PA.
Brown Building, 185 Summer Street, BOSTON, MASS.

CATLIN & CO.,
Yarns.
67 CHAUNCY STREET, BOSTON.
216 CHURCH STREET, NEW YORK.
206 CHESTNUT STREET, PHILADELPHIA.

Ballou Yarn Co.
PROVIDENCE, R. I.
Harness and Seine Twines and other Job Gassing, Winding, etc. All Numbers.
GASSED .·. YARN .·. SPECIALTIES

A. D. SALKELD & BRO.,
With FRED'K VIETOR & ACHELIS,
YARNS.
66-72 LEONARD STREET, - NEW YORK.

FRED STERNBERG & CO.
Successors to EICHMANN & STERNBERG,
530 Broadway, - NEW YORK.
MERCERIZED / TURKEY RED / GASSED } COTTON YARNS.
JACQUARD and HARNESS TWINES.

J. S. DODDS,
346 Broadway, N. Y. Life Bldg., New York, N. Y.
MERCERIZED YARNS
Two and Three Ply, for all purposes,
In Peeler, Egyptian and Sea Island, gassed and ungassed, natural and dyed. Fast Black for cross dyeing a specialty.

EDDY & STREET,
Cotton, Woolen,
Yarns and Braids
Worsted, Spun Silk.
PROVIDENCE, R. I.

CAPACITY, 50,000 Spindles.

ORSWELL MILLS

FITCHBURG, MASS.

COMBED **COTTON YARNS** CARDED

In Chains and Skeins, on Balls, Beams, Spools—Single or Twisted.

Crochet Lace Edgings

Spun Silk, Splicing Yarn, Mercerized Yarns, Cotton Warps, Sewing Threads, Tapes, Braids, Domets, Cambrics, Silesias. : : :

Write for Prices and Samples. **George W. Chapin** 229-231 Church St. PHILADELPHIA

THE MALCOLM MILLS CO.,

MANUFACTURERS OF

FANCY YARNS and POLISHED THREADS.

Offices: 229 Chestnut St., Philadelphia.

Mills: Frankford, Pa.

TRADE MARK E-G YARNS CLOTH

ENGLISH-GREENE CO.

Commission Merchants,

Greene Bldg., 26 Fountain St., Prov., R.I.
72 Leonard St., New York.
300 Chestnut St., Phila.

Consignments Solicited for Southern Mills. Liberal Advances Made and Sales Cashed Promptly.

SAVOGRAN

Cleans Wool, Floors, Anything.

INDIA ALKALI WORKS, Boston.

Indian Orchard Company.

Cotton Warps and Yarns. In Gray and all Colors, Single or two or more Ply, and Cable Cord.

Novelty Yarns. in Various Patterns, Colors and Twists.

Carded and Colored Cotton. For Mixing with wool, Machined or in Roving.

J. MORGAN-PRES. H. K. WRIGHT-TREAS. W. C. GODFREY-AG'T.

Indian Orchard, Mass.

22's	21-21½
14/2	19½
16/2	20-20½
20/2	21½-22
30/2	25-26
40/2	28-29
16/3 slack	19½-20
12/3 slack	19
8/3 carpet	17½-18
8/3 slack	17½-18
9/4 slack	17½-18

Warps (mostly Southern):—

14's to 16's	19½-20
20's to 22's	21-22
26's	23
14/2	20-20½
16/2	20½-21
20/2	22-23
24/2	23-24
30/2	25-26
40/2	28-29

Mixed colored yarns (mock twist, half colors):—

6's to 10's	21-22
12's to 14's	22½-23½
16's to 18's	24-25

Silver and jaeger, 1½c. over white.
Mock Egyptian, 2c. advance over white.
Egyptian, 4c. to 5c. above best quality white.

Worsted Yarn.

Spinners are working hard for orders. Offers are comparatively easy to secure but are generally from 3 to 7 cents under what spinners can accept. Weavers claim they are in no hurry about placing orders and the advance talk is all bluff. We give below the opinion of three spinners of the market in reply to offers received and prospective business.

"In reply to your offer we do not care to sell this concern a further order of the yarn at the price of the last order. We firmly believe that worsted yarn will advance considerably within the next few weeks, and we do not believe that this is a favorable time to spring a new price on them. It will be better to let them wait until the market is a little more buoyant."

Another spinner writes in reply to an offer: "You say the best price you can get is ——. I would advise you to drop this party and look for another customer, as we cannot sell the yarn for this price. We have just bought wool at 1 1/2 cents advance and could not afford to make this yarn at even a higher price than what we have asked had we not the wool on hand."

Still another writes: "I think it is a very bad time to solicit orders. Wool is very dear and spring goods will not be fully opened until the 15th July to August 1st, and our own price is too cheap as the fine wool market is today. Do not push for orders. Let the trade come to you. Your party will not buy the yarn he offers on at the price offered as the top costs us within 10 cents of what he offers. We are disposed to wait for the market to develop before making any prices."

Still another spinner writes: "We do not advise your party to wait until August before placing their order as they will certainly have to pay more for this yarn at that time. For their own benefit you

TRY OUR
Silkine, also Lisle Silk
FINISH
—FOR—
Hosiery, Knit Goods, Yarn, Fast Black, Harsh Colors, and Fibres.
O. K. SOAP CO., 968 Franklin St., PHILA.

RICHARD A. BLYTHE,
Commission Merchant,
COTTON YARNS OF EVERY DESCRIPTION.
114 Chestnut St., Philadelphia.

LINEN YARN IMPORTER.
HUGHES FAWCETT, 115 Franklin Street, NEW YORK.
Flax, Hemp and Jute Line and Tow Yarns, For Weaving Purposes.
Linen Jacquard Harness Twines, Fine Cotton Harness and Heddle Twines, For Cotton, Silk, Woolen and Carpet Manufacturers.
Correspondence solicited. Samples promptly furnished.

C. MOORE & CO.,
Manufacturers of
TWINES, THREADS AND YARNS,
Jacquard Harness Twines of all kind on hand and made to order.
S.W. Cor. Fifth and Market Sts., Phila.

DEXTER YARN CO.
Cotton Yarns in Cops, Cones and Skeins; on Beams or Spools, Single and Twisted, Cable Cords and Twines.
PAWTUCKET, . . R. I.

Walcott & Campbell Spinning Co.
Fancy Hosiery Yarns
IN ALL COLORS
New York Mills, Oneida Co., New York

ALLEGHENY WORSTED MILLS,

Thomas Wolstenho'me Sons & Co.,
MANFRS. OF
ALL NUMBERS
SINGLE AND TWO-PLY,
On Cop or in Skein, for Weaving and Knitting Purposes, in White, Natural and Fancy Mixes.

Worsted
YARNS
Sell Direct,
Office and Mills, Frankford Ave. and Westmoreland St., Phila, Pa.

POCASSET WORSTED COMPANY,

Worsted Yarns.

OFFICES:
6th Floor, Banigan Building,
PROVIDENCE, R. I.

CRANSTON WORSTED MILLS.

Worsted and Mohair Yarns—White or colors, in skeins, on spools, cones, or shuttle bobbins.

Novelty Yarns—of Mohair and Worsted. We are the only manufacturers in the United States making these yarns from the raw material to finished product and making yarns only.

Genapped Yarns of all kinds. Doup Yarns. Harness Yarns. For Braids, etc.

DYERS OF YARN AND SLUBBING. BRISTOL, R. I.

French System. Bradford System.

B. F. BOYER CO.,

MANUFACTURERS OF

WORSTED AND WOOLEN YARNS,

Office and Mill, Delaware and Cooper Streets. CAMDEN, N. J.

RICHARD CAMPION,

Selling Agent for
BRISTOL WORSTED MILLS,
HIGHLAND WORSTED MILLS.

Worsted Yarns

ALL QUALITIES AND NUMBERS.
17 Bank Street,
PHILADELPHIA, .. PA.

YARNS

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77
SUMMER STREET.
ANDREW J. SOLIS, Jr. & CO.

KEYSTONE SPINNING MILLS CO.,

Manufacturers of
Woolen Carpet and Rug Yarns,
Wool Scouring, Carbonizing, Garnetting,
1631 No. Second St. PHILADELPHIA, PA.

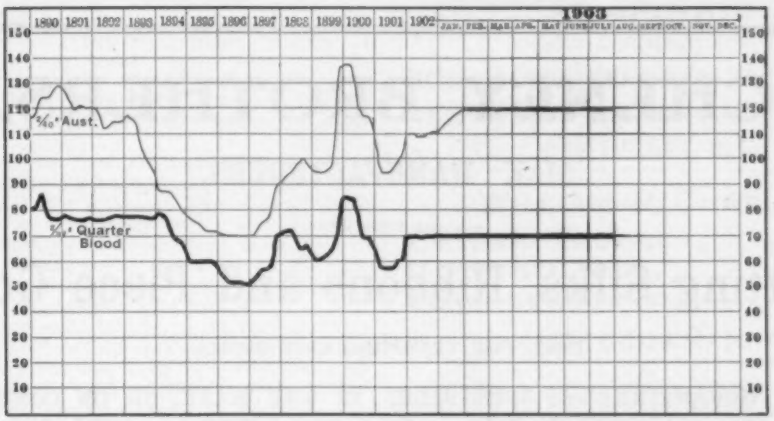


CHART SHOWING RANGES OF PRICE OF WORSTED YARNS.

ought to induce them to place their order now. When it is on our books the price is secured."

Now although spinners are very fine in their ideas as to price all their orders have run out and unless there are orders placed many spinning mills will be stopped. The weavers are holding out of the market for all kinds of yarn and the market for wool is advancing. Weavers have some strange ideas as to what they should pay for yarn. They say they do not think yarn will be any higher and therefore will place no orders until they know exactly what they can do on orders. All want to wait until the light weight season opens before placing orders and believe that the market should be lower rather than higher. Some weavers say they are going to use considerable worsted yarn later on account of the advance in cotton yarn, but when asked to place orders and cover themselves, state that they purchased last season and had the yarn on hand and had lost money and therefore intended to buy on the market.

It is the opinion of the writer that because of high worsted and cotton the coming light weight season will be a failure and that a hand to mouth business so far as the weavers are concerned will be the result. The worsted spinners will suffer the worst, as the business will all go to wool cassimeres. After the season has been spoiled the spinners will get more reasonable, but it will then be too late. The French spinners are getting some offers and are more reasonable in their ideas than the Bradford spinners. The bulk of the business is coming on medium yarn and prices are being firmly held with the prospect of a material advance.

SILK NOILS AND SILK NOIL YARNS
In White and Colors.
A. T. SKERRY & CO., 47 Leonard Street, NEW YORK.

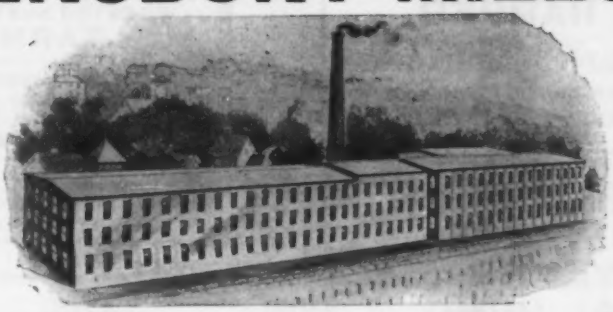
MOHAIR LOOPS, KNOTS AND FANCY YARNS FOR DRESS GOODS & CLOAKINGS.

QUEENSBURY MILLS WORCESTER MASS.

MOHAIR TOPS AND YARNS FOR WEAVING

LUSTRE YARNS FOR SERGE LININGS

ALPACA YARNS



SPINNERS OF MOHAIR YARNS FOR ZIBELINES

DRESS GOODS YARNS
KNITTING YARNS
WORSTED YARNS

MOHAIR

CHENEY BROTHERS,

SILK MANUFACTURERS,

——ALL KINDS OF——

Knitting Silks, Ribbons and Piece Goods

USED FOR TRIMMING KNIT GOODS.

TRAMS, ORGANZINES and SPUN SILKS, IN THE HANK, OR ON CONES, FOR MANUFACTURERS' USE. SILK FOR SPECIAL PURPOSES MADE TO ORDER.

Mills: SOUTH MANCHESTER and HARTFORD, CONN.

SALESROOMS:

477, 479 and 481 Broome Street, NEW YORK.
929 Chestnut Street, PHILADELPHIA.
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239 Fifth Avenue, CHICAGO.

WILLIAM RYLE & CO.,

Foreign and Domestic

Spun Silk Yarns and Noils.

Domestic Thrown Silk of every description. Fine Pure Dye Silks for the woolen trade a specialty. Importers of European and Asiatic Raw Silk.

54 Howard St., cor. Mercer St., NEW YORK.

E. C. HARPER,
WORSTED and WOOLEN YARNS,
MERCERIZED COTTON,
395 BROADWAY, TEL. 1020 FRANKLIN NEW YORK.

Speed & Stephenson,
WORSTED and WOOLEN
YARNS
A SPECIALTY.
ALSO TOPS.
170 SUMMER ST., BOSTON.
Long Distance Tel. 4168-2 Main.

FIRE HOSE CORDS — From long staple cotton—6s to 20s yarn in 2 to 100 ply—16 lbs. without a knot.
COTTON WARPS — On beams—single or ply yarns, grey, bleached or colored.
GLAZED YARNS — All plys—any color—for braiders, harness and sewing threads.
UNIVERSAL WIND — For braider cops—warp yarns—grey or colored—2 inch to 12 inch traverse.

Dyeing facilities are new and best quality work guaranteed. We are prepared to dye yarns for other parties.

WHITTIER MILLS, Selling Office, SPRINGFIELD, MASS, MILL: CHATTAHOOCHEE, GA.

Top manufacturers are running slow and but few orders are being secured. Fine tops are firmly held; but few orders are being placed. It looks as though the coming season would be a hand to mouth affair so far as the worsted spinners are concerned. We do not believe they will lower prices, neither do we believe they will secure many large orders.

Weavers in the East are beginning to secure orders which the Philadelphia weavers have been unable to fill. We know of several good sized orders being secured in this way. This is practically all the business which has been secured up to date by the weaving mills. The light weight business has not yet come to hand and in consequence weavers will place no orders for yarn.

Spinners urge haste to buy on the part of weavers if they would buy cheap and weavers say they are in no hurry and will place no orders until they see how the light weight business is going to pan out. We quote as follows:

2/40's Australian	1.20
2/40's XX Delaine	1.10
2/40's Half Blood	1.05
2/20's Half Blood	.85
2/36's ⅜ Blood	.75
2/26's ¼ Blood	.68

Woolen Yarn.

Spinners continue busy with orders which will last well into the year. The coming business of the light weight season is largely a woolen yarn affair and in consequence the mills being short of woolen yarn machinery are forced to purchase from the outside woolen spinners.

The fancy worsted weavers are using large quantities of woolen spun yarn for the filling of their cloth. This yarn is largely made from shoddy and is very difficult to weave. It is necessary to use yarn of this kind in order to reduce the cost on fancy worsteds. The worsted mills are increasing the amount of woolen yarn used in every way and the mills using the largest amount are securing the greatest percentage of business.

Some weavers are making cloth almost entirely from woolen yarn. The knitters of hosiery are slow at present. The original orders have been placed and the duplicate orders have not yet been placed. The bulk of the business so far has been on cotton hosiery placed before the advance in cotton. The new business must stand a good advance and buyers of underwear are beginning to understand what they are up against. Knitters have made the prices on their commodities as low as possible having in view the cost of raw material and in fact so low are these prices that they care not whether they secure the orders or not. Said one prominent knitter: "For the first time in my life I care not whether I secure orders or not. The prices expected by the buyers are so low and material is so high that I care not whether I secure business or whether I lose it."

The season of course has just started and the sharp advance in cotton will force many knitters to use woolen or merino yarn. Garnetted thread waste is being extensively used in place of Australian lambs' wool. The price ranges from 55 to 60 cents to 65 cents per pound, against 80 to 85

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Formerly E. JENCKES MFG. CO.
Carded and Combed Cotton Yarns for Weavers and Knitters.
Double and Twist Yarns for Woolen Trade.
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Cotton Cloth,
Silesia, Sateens,
For the Underwear Trade.
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MERCERIZED YARNS.
Mercerizers, Dyers, Bleachers and Coners,
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American Cotton Yarn Exchange
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COTTON YARNS
From Northern and Southern Mills.
American, Egyptian, Peruvian and Sea Islands.
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Dixon's Flake Graphite adds to the lubricating power of any grease and any oil greatly out of proportion to the amount used. Actual test shows that one-seventh of the lubricating graphite added to the oil increases the lubricating power one-half. Ask for booklet 120-C.
JOSEPH DIXON CRUCIBLE CO.,
Jersey City, N. J.

Woolen and Merino YARNS
Eaton Rapids Woolen Mills,
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JOSEPH M. ADAMS CO.
WOOLEN YARNS,
Carpet Backing and Rug Yarns a Specialty.
ARCOLA MILLS,
Main St., foot of Centre St., Manayunk, Phila.

Woolen and Merino Yarns,
1 to 10 Runs, at reasonable prices.
All Wool, Mohair and Wool Spun or Mixed Cotton and Shoddy Yarns, in white, gray, and colors.
Dress Goods Yarns a Specialty.
E. M. ROCKWELL, - - LEOMINSTER, MASS.

Knitting and Weaving YARNS.
Cones, Cops, Warps, Skeins,
Single, Double, Three-Ply, etc.
Peeler, Egyptian, Mixed Colors.
Large Assortment.
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223 and 225 Chestnut Street,
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SHODDY WM. H. H. SLACK & BRO., Springfield, Vt.
Carbonized Stock a Specialty. **FLOCKS**

M. B. SCHWAB, Pres. H. RAWITSER, Treas.
ED. GLUECK, Sec. and Gen. Mgr.
RIVERDALE WOOLEN CO., MANUFACTURERS OF
.. Shoddies ..
Of every description. Capacity 7,000,000 pounds per annum.
Custom Carbonizing and Garnetting a Specialty.
New York Office.
140 DUANE STREET. RIVERDALE, NORTHBRIDGE, MASS.

cents for Australian lambs' wool. These high prices have largely checked the use of lambs' wool. Woolen spinners find it hard to purchase material at prices which are satisfactory to customers of yarn. There is, however, a sign of hope that a break in fine wool may be expected. This is from the fact that the worsted cloth and woolen cloth manufacturers are using largely 1/4 to 3/8 blood wool and are leaving the finer grades entirely alone. From London the report of the situation is sized up as follows: The high level of fine wool is mainly due to the scarcity of this quality, the value of the raw material being beyond that of yarn or cloth. Users consequently only buy to cover requirements. Holders of wool are firm, with the result that the yarn spinner is careful to get his order first before buying wool. The spinners are doing much commission work at this time.

Top makers are shutting down their plants for lack of work, although the price of top has advanced. The rubber boot and the eiderdown trade is using considerable yarn. The demand for woolen yarn 2 ply for sweaters continues good and is displacing worsted to some extent. The woolen yarn spinners of the East are well pleased with the outlook and are doing well in all particulars.

The Rag and Shoddy Market.

As is usually the case at this time of the year, these markets are dull and featureless. There has been no change in prices, but a strong undertone has prevailed in sympathy, doubtless, with the strength of wool and cotton. A conservative factor is the weak opening of light weight lines of goods. Much less shoddy can be used in light weights than in heavy goods and this combined with a dull trade in light weights has kept down the demand for shoddy.

Merino rags are in better demand than are other grades and many dealers have been unable to fill their orders for this grade. Worsteds are also in good request. Owing to the shutting down of many knitting mills, knit stock has been dull, but prices are firm and bargains scarce.

New clips have been especially quiet. There has been a good supply from the clothiers and dealers have been unable to dispose of the stock with corresponding freedom. Such conditions are to be expected at this season.

The same quiet prevails in the shoddy market. Mills are on light weight goods and using but a small amount of shoddy. There is, however, no indication of a decline in prices.

We quote as follows:

SHODDIES AND EXTRACTS.

White yarn, best all wool	38-40
White knit, all wool, best, fine	28-32
White knit, No. 2	23-25
Light yarn, extra fine	25-28
New pure indigo blue	23-25
Fine worsted, new black	26
New blue clip, best, fine	20-22
Dark mixed yarn, extra fine	22-24
All wool yarn, medium and coarse grades	15-20

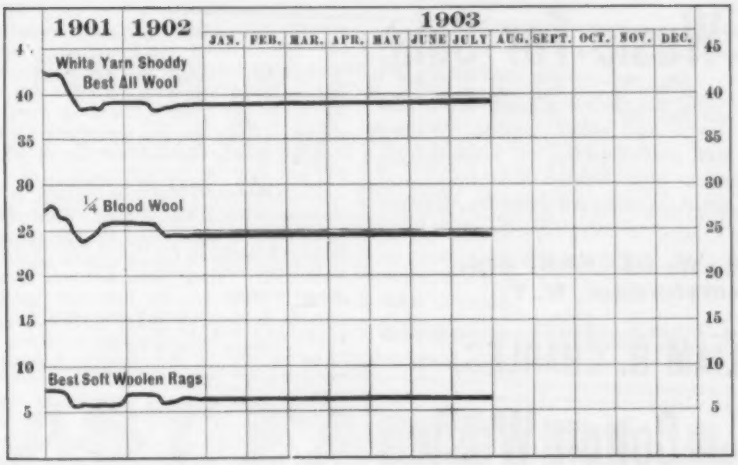

CHART SHOWING RANGE OF PRICES OF SHODDY, RAGS AND NOIL.

Merino.

Fine light, all wool, No. 1	24-25
Medium light, all wool, No. 1	16½-17½
Medium light, all wool, No. 2	14-16
Fine black, all wool	20-22
Fine dark, all wool, best grade	20-21
Medium dark, all wool, No. 1	13-15
Medium dark, all wool, No. 2	12-13
Red knit stock, strictly all wool	19-20
Red flannel, all wool	19-20
Dark blue for hosiery, strictly all wool, No. 1	17-20
Dark blue for hosiery, not all wool, No. 2	12-14

DELAINE EXTRACTS.

Light	19-22
Medium light	15-17
Regular gray	12-13
Black	14-15
Fancy colors	16-20

WOOLEN RAGS.

Fine merchant tailors, all colors	10½-12
Choice light colors	13-15
Browns	12-13
Blacks	9½-10½
Fine blues, plain	11-12
Fine dark	10-11
Medium dark	7-8

Worsteds.

Blue	16-18
Black	21-23

We quote as follows:

Serges.

New black	15-16
New blue	16-17

Flannels.

New scarlet	18½-22
New blue	17-18
Cloakings	3-4

SOFTS AND KNIT STOCK.

Soft woolens, best	7-7½
Old white flannels	14-16
White flannels, No. 2	11-12
Old red flannels	9½-10
Light blue flannels	7½-9
Old blue flannels	6-7
Old plaids	5-7
White stockings	17-18
White hood stock	20-21
Clear hoods	9-10
Red stockings	9-10
Blue stockings	8-9
Fancy stockings, No. 1	7-9
Gray stockings	9-10
Black stockings	9-10
Knit stock comforters	6-7½
Red knit	9-10
Light gray knit	9-10
New light fancies	16-18
New fancies	12-14

Merinos.

Light, fine	15½-16
Light, coarse	8-8½
Fine, dark	11-12½
Dark, No. 2	5-6½
Coarse dark	4-4½
Blue	10½-11½
Blue—seamed	14-15
Black—unseamed	11-12
New black	18-20
Small	3¼-4
Bunting	6-8

FLOCKS.

Shear, fine white, all wool	9-11
Fine indigo blue, all wool	9-9½
Fine black, and blue, all wool	7-8
Fine dark, all wool	5-6
Gig, fine, all wool	3-4
No. 1, black, all wool cut	6-7
All wool, fancy, shear and gig	2½-3½

COTTON WASTE.

No. 1 Spinners	10½-11
No. 1 Machine	6-6½
No. 2 Machine	5-5½
Machine Cop	0-6½
No. 1 Cop	7-7½
No. 1 Card	9½-10
No. 2 Card	8-9
No. 1 Oily Card	4½-5
No. 2 Oily Card	3½-4
Egyptian Card	10¼-10¾
Peeler Combing	11¼-11½

Cotton Waste For Sale.

Have large lines of Soiled Card, white and colored Oily Card and other Cotton Wastes suitable for the manufacture of Cassimeres, Satinets, Unions, etc. Also Combers and other clean Cotton Wastes for Hosiery, Underwear, etc.

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COTTON YARNS.

Contracts made with Cotton and Woolen Mills for Yearly Waste Production. Correspondence solicited. Shepperson's Code, 1878. Cable Address "Charles."

Egyptian Combing	11-11¼
No. 1 Linters	4-5
No. 2 Linters	3½-4
White Clips	6-6½
Colored Clips	3-4¾
No. 1 Picker	2½-3
NOILS.	
Australian	48-50
Fine domestic	38-40
½ Blood	24-28
⅜ Blood	22-23
¼ Blood	17-19
Braid	21-22
Carpet (white)	14-18
Carpet (colored)	10-12½
Seedy.	
½ Blood	35-37
⅜ Blood	27-30
¼ Blood	23-26

Another Step Forward.

In no other item of textile mill supplies is the percentage of waste greater than in that of lubricating oils. We think mill agents will agree that—at a conservative estimate—for every drop of oil that is worn out in reducing friction between the surfaces of the average bearing, at least three other drops either never reach the bearing in the first place, or if they do reach it leak out of it at once, and besmear the belts, the goods in process and the floors.

This wholesale waste of oil has come to be regarded as a necessary evil by most mill men, although they know that if the same proportion of loss existed in every item on their supply sheet, their mills would not pay a dividend. They abate the nuisance as much as possible by installing numerous drip-pans (although when these occasionally run over or are knocked upside down by an unshipped belt, the remedy proves worse than the disease) and frequent wiping down with waste and let it go at that. There is certainly a fortune ahead of the man who can evolve an oil which will feed as positively as the present fluid oils, and yet will not drip off the bearings.

Of interest in this connection is the process of making lubricating oils non-fluid which was originated and is controlled by the New York & New Jersey Lubricant Co., of 14-16 Church Street, New York City. They claim for their non-fluid oils that same remain on the bearings until entirely consumed, thus elimiating the drip and waste incident to the use of fluid oils, and lessening the time spent in oiling up, besides largely reducing the cost of lubrication.

These products are adapted to nearly all classes of bearings in textile mills. The makers offer to send a testing sample gratis, by prepaid express, to any textile manufacturer upon application. This proposition seems worth investigating.

Primitive Methods of Spinning.

Livingstone, the great African explorer, found the natives of Africa employing a primitive method of spinning the native cotton, which was described as follows by one of his staff:

"Some of them have an instrument like the barrel of a pair of swifts with wooden spindles about six inches long at each end. They take the cotton in one hand, twist it around the end of the spindle two or three times, then fasten it to the barrel, and holding it between the thumb and finger of the left hand send it round with surprising speed while guiding the cotton with the right hand.

"Others again have a stick eighteen inches in length with something like a cork at the end to balance. They twine the cotton with their fingers, then tie it on the stick, which they hang perpendicularly, and whirl it round by striking it with one hand. The latter way is the slowest, but it certainly makes the finest thread. The first method will produce (at least what I have seen) cotton yarn from Nos. 10 to 16; the latter mode from Nos. 20 to 30.

"The style of weaving is slow and the cloth imperfect. It is very simple. Two men work at one loom; when warping they walk to posts about two or three yards distant from each other till they finish the web. They then draw it, the one half through the heddles with only one eye, the other half through no heddles at all. They then get the warp fastened at both ends to cross sticks which they fasten to a pin at each end and put some green sticking stuff on the cross sticks to keep the yarn from slipping.

"They lift the one shed by lifting the heddles, then the cross shed is lifted by pulling forward a sort of lease rod about two inches thick which, when turned on its edges, raises the shed. This is done by one of the men; the other sits with a stick about a yard in length on which is wound the web. When the sheds are raised he puts this through and knocks up the shot before. When they get what you would call their bore wrought they draw the pins behind, roll on the cloth, and in with the pins again and so on till the 'wab's oot.'"

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Dyers and Finishers of Dress Goods, Men's Wear and Cloakings, such as Venetians, Armures, Soleils, Crepons, also Silk Warp Fabrics, Cotton Warp Linings, Suitings, Clays, Serges, Worsted Damasks, Tapestries and Shirtings.

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WE GUARANTEE

A Deep Shade of Brilliant Blue Black

Guarantee:
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- Quickest, Safest, most Reliable and Cheapest Process, without the Need of Skilled Help to do Perfect Work.

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Guarantee Fast to Wear.
" " " Exposure, Light, Gas, Etc., Etc.
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Guarantee Stainless, no Crocking.
" Free from Lint.
" " " Bleeding, Wash Proof.
Guarantee Strongest Fibre,
" Pure Dye, Free from all Impurities.
Guarantee Unaffected by Repeated Washings.

A Thorough Oxydation, Dyeing Through and Through the Fibre, so Essential to Wearing, and not only on the Surface, Like on Sulphur or other Direct Blacks.

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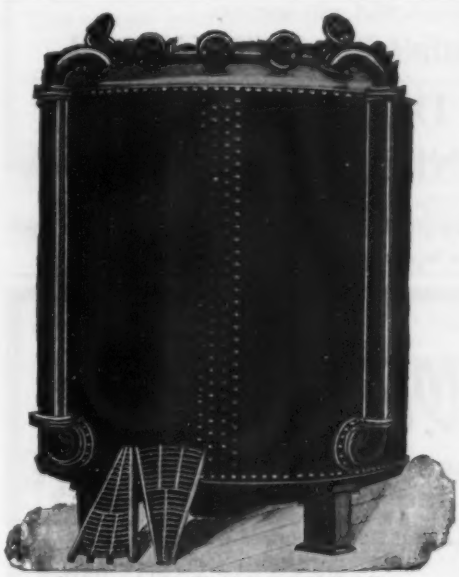

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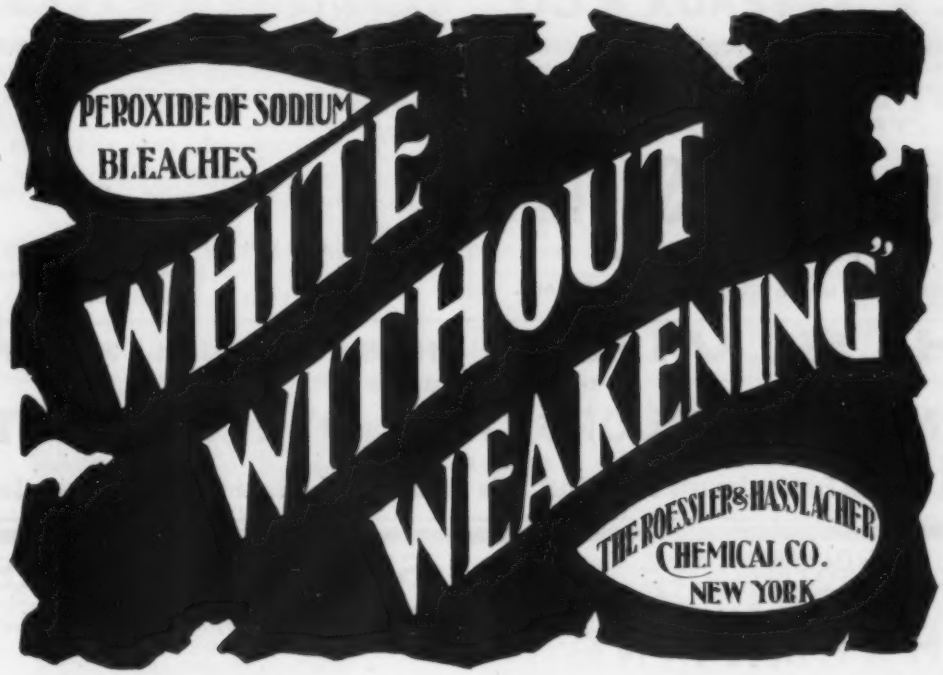
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For Wool Soap and Scouring. For Mercerizing Cotton, Bleaching, Dyeing, etc. For Silk Makers, etc.

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Sulphide of Sodium

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Safest to use with the Sulphur Colors.

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The best scour for wool in the world.
A perfect solvent of grease in any form, can be used on Raw Wool, Yarns, or Piece Goods.
Does not injure the fibre, and leaves the wool clean, soft and lofty.
Sold entirely on merit. Order a barrel for trial.
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SPECIALTIES:

New Vila Black Extra, an Improved Sulphur Black. The Latest Novelties in Direct Fast Greens Equal to Sumac.

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Pyrol Blacks, Pyrol Brown, Pyrol Bronze, Pyrol Olive,
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New fast one-dip sulphur colors standing acid, alkali, sunlight, etc. No after treatment required.

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FUSTIC,
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Sizing, Stiffening, Softening and Finishing Compounds, Glues, Gums, Dextrines, Starches, China Clay, Bone Size and Grease, Soap, Tallow, Weighteners,

EVERYTHING IN SIZINGS, Etc. SAMPLES MATCHED. HIGH GRADE GOODS.

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DYE AND BLEACH PLANTS

for Hosiery, Underwear and Skein Yarns installed and equipped complete.

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Formulas sold for "Sanitary" Fast Black Colors and Bleaching.

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Drying and Sulphur House Poles of Natural Round Water Grown Cedar for Cotton, Wool, etc. Special Hardwoods in Standard No. 1 and "Selects" without knots, grades, for Silk Dyeing. Manufactured by, prices and all information from

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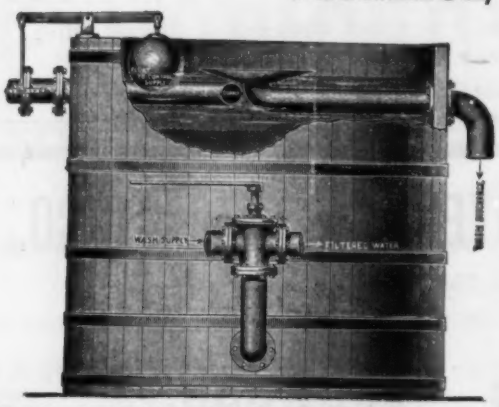

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Our filters are already in use in a number of the representative textile mills of the country, from whom we have received many expressions of satisfaction. Our representative will call and explain our system whenever desired.

TAUNTON-NEW BEDFORD COPPER CO.,

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Copper Printing Rollers, Singe Plates and Sheets.

OUR GUARANTEE: { Superior Quality. Prompt Shipments.

Dyeing, Bleaching, Printing and Finishing Machinery.

PAPER ROLLS,
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SPECIAL MACHINERY BUILT TO ORDER.

THE FRANKFORD MACHINE WORKS,

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We Build

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OF ALL SIZES

Pine, Cedar, Cypress and Southern Pine
Draw Lugs for Tank Hoops

GET OUR ESTIMATES

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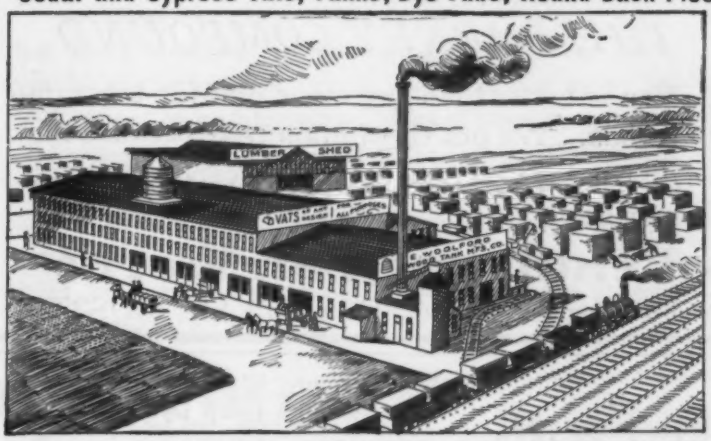
Cedar and Cypress Vats, Tanks, Dye Tubs, Round-Back Piece Goods' Dye Tubs, Bleaching Tubs, Boiling Kiers, Reservoir, and

ANYTHING IN THE SHAPE OF A TANK.



We now have our new plant, covering over two acres of ground, in complete running order, and can serve you to any extent and with promptness

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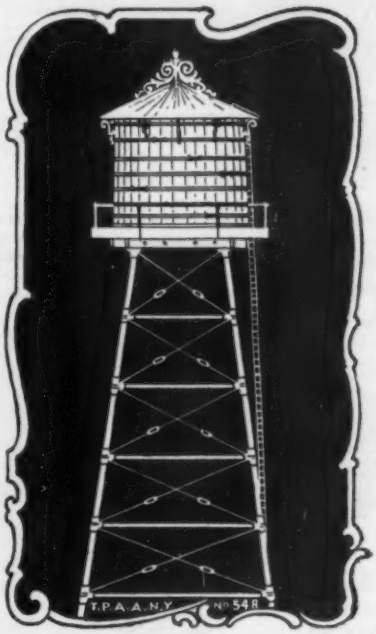

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To warrant spending money on poor equipment of any sort.

The Caldwell Red Cypress Tank

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CALDWELL STEEL TOWER

cost little more than the cheap kind, and are incomparably more safe and durable. Hooping is so exact that bursting of tank is impossible, and tower so strong that collapse is out of the question. Our catalog and price list is free.

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Two Fans Are Better Than One

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THE BARNEY COMPOUND

Fan is better than any other one for the same reason. We put them in on trial because they do what we say they will. Correspond with our engineers

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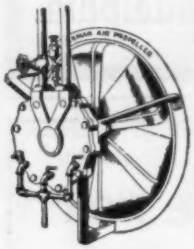
Blackman Fans

With Direct Connected Engines.



ECONOMICAL FIRST COST OPERATION

Can be run at any speed and any time. No long shafting and belts to waste power.

For Dye Rooms, Factories, Boiler Rooms, or where there is moisture or dust they are the best apparatus ever installed.

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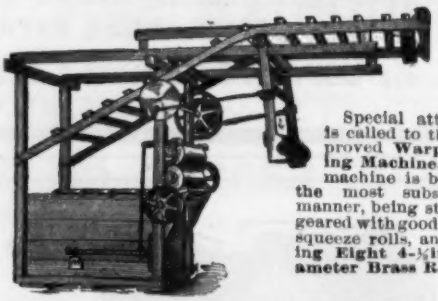
Write for particulars.

The Reliance Warp Dyeing Machine.



Special attention is called to this improved **Warp Dyeing Machine.** This machine is built in the most substantial manner, being strongly geared with good, heavy squeeze rolls, and having **Eight 4-½in. Diameter Brass Rolls.**

This machine, with our Improved Plater-down has met with marvelous success, and parties desiring machinery of this class, can make no mistake on ours For further particulars and prices, address

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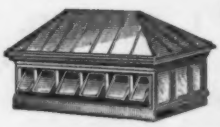

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Manufacturers and Erectors of

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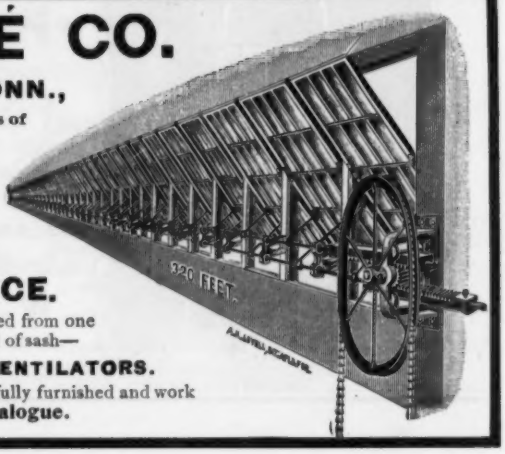
A line of sash 500 feet long can be operated from one station if desired. Adapted to any kind of sash—

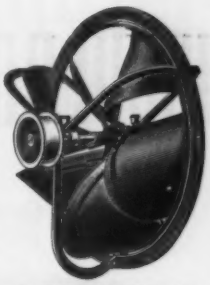
SKYLIGHTS, CORNICES, VENTILATORS.

Correspondence solicited. Estimates cheerfully furnished and work guaranteed. **Send for Catalogue.**



We Admit it IS Remarkable

But every word in our new circular about the Berry System applied to Cloth Dryers, etc. is backed up by the mill owners' own statements. Many of these men did not realize that they were not getting the best possible results. You may be in an equally contented frame of mind. If you do not want to be disturbed from your quiet repose, better not read the circular, for it will make you uneasy in your mind until you have found out what we can do with YOUR dryer.



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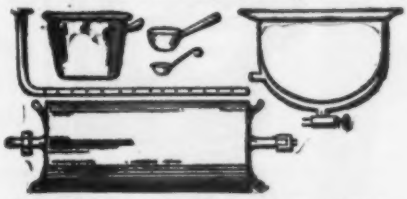

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Repairing Neatly Done.

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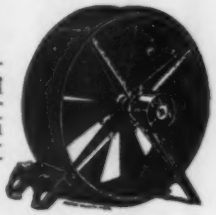
Ventilating, Heating, Humidifying, Cotton and Wool Conveying by Blower System, Tin Cylinders, Roving and Drawing Cans, Separators, Tape Pulleys.



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TWO BIG FACTORIES.

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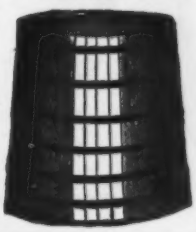

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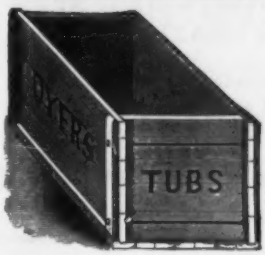
Actively represented all over United States and Canada.

Manufactures and installs sprinkler heads, dry valves and alarm valves. Universally approved by insurance interests. Write for full particulars.



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Manufacturers of

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2915-2933 North Second Street,

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Tubs and Tanks of all kinds for Dyers, Bleachers, Factories, etc.

Down Town Office, 140 Chestnut Street, Corner Second.

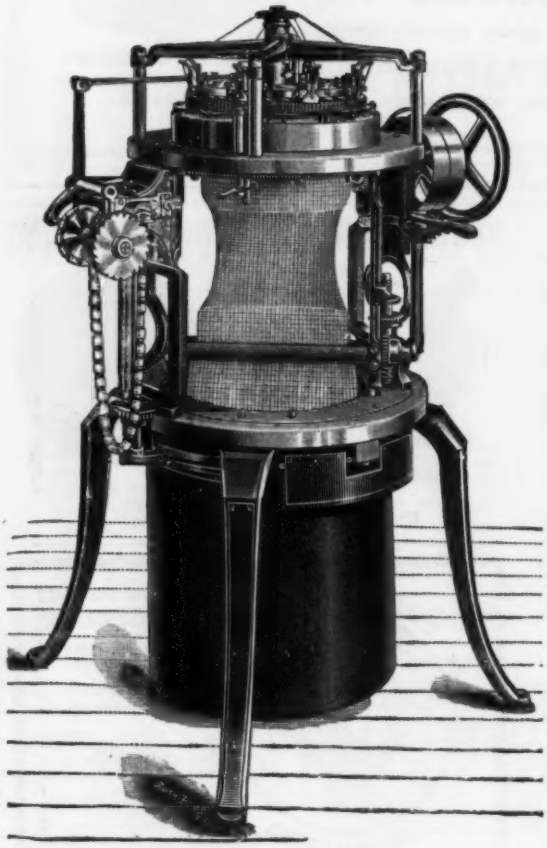
Hours from 12 to 1.

McMICHAEL & WILDMAN MFG. CO.

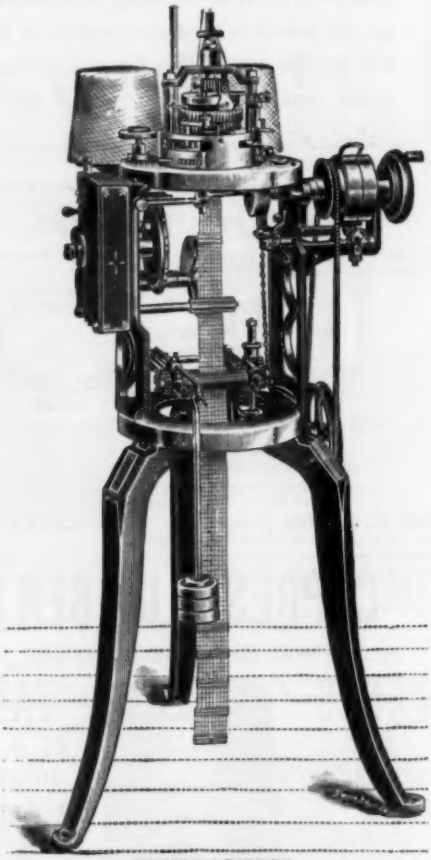
CIRCULAR RIB KNITTING MACHINERY

AUTOMATIC AND PLAIN

For all classes of Ribbed Hosiery and Underwear, Combination Suits, Sweaters, etc.



AUTOMATIC BODY MACHINE.



HOSIERY RIBBER.

ESTABLISHED REPUTATION FOR LARGEST PRODUCTION, BEST QUALITY FABRIC, DURABILITY, ECONOMY OF OPERATION

Full Particulars, Description and Samples Furnished upon Application to the

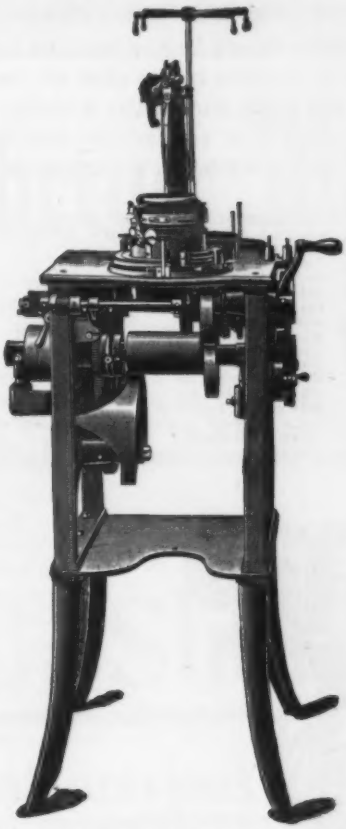
McMICHAEL & WILDMAN MFG. CO.

NORRISTOWN, PENN.

Acme Automatic Knitter

FOR SEAMLESS HOSIERY

ALL KINDS AND GAUGES



Best method of transferring ribbed legs and tops.

Greatest production of perfect work at least cost.

All latest attachments and improvements.

Our new type of machine, just out, having absolutely positive feed on pattern mechanism, which is set by dial, and graduated disc when changing styles and sizes, is one of the greatest improvements in knitting machines for a long time.

For particulars address

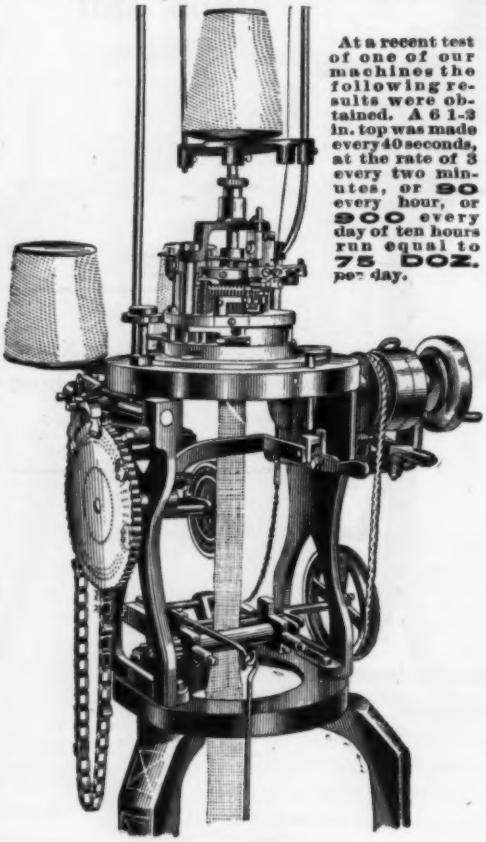
MAYO KNITTING MACHINE & NEEDLE CO., FRANKLIN FALLS, N. H.

Philadelphia Office: Knickerbocker Building, Cor. 6th and Arch Sts.

We manufacture all kinds of Latch Needles of superior quality.

RUTH COMPANY WINS PATENT SUIT.

The United States District Court for the Eastern District of Pennsylvania has recently rendered a decision in the case of the McMichael & Wildman Mfg. Co. against the Ruth Automatic Knitting Machine Co., and decided that the new pin and slot connection, devised by Mr. George W. Ruth, Superintendent of the Ruth Co.'s factory, is not an infringement.



At a recent test of one of our machines the following results were obtained. A 6 1-3 in. top was made every 40 seconds, at the rate of 3 every two minutes, or 90 every hour, or 900 every day of ten hours run equal to 75 DOZ. per day.

PATENTEES AND MANUFACTURERS OF

Ruth Ribber, Ruth Sleever, Ruth Splicer, Ruth Automatic Stop Motion, Ruth Lace Device, Ruth Friction Pulley, Ruth Belt Shift, Ruth Needles.

The United States Court says:

"Much testimony was taken upon two questions that I do not find it necessary to decide. x x x It seems to me that the case must be decided against the complainant (The McMichael & Wildman Mfg Co.) on the question of infringement, and that, therefore, no other question demands attention. Manifestly, the patent is to be narrowly construed, and I think had little claim to the benefit of the doctrine of equivalents. The defendant's (The Ruth Company) machine has a pin and sloth connection between the shafts instead of the connection described in the claims of the McMichael & Wildman Manufacturing Company's patent. x x x x Incidentally, it may be stated that the dial cam of the Ruth machine is wholly different from the dial cam in the patent and neither can perform the other's work."

The pin and slot connection is a small part of our machine as a whole. We claim other features for the Ruth ribbers and body machines of marked superiority, which has made the Ruth machine so popular in the trade. We are able to meet all competition and protect our customers, and are ready as ever to furnish superior machines at low prices. Write today for our circulars and price lists.

RUTH AUTOMATIC KNITTING MACHINE CO. Box T-W, YORK, PA.

We have a proposition for every manufacturer of Hosiery! Have you heard of it? Write at once.

Friedberger Mfg. Co.

SPRING 1904 LINE

EDGINGS AND BRAIDS

conceded by competent judges

Head and Shoulders

above all previous efforts both in design and price : : : :

ALL GOODS SOLD DIRECT

Mills at Germantown, Phila.

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Circular Rib Knitting Machinery,

UNDERWEAR MACHINERY,

For Ladies' Vests, Combination Suits, Corset Covers, etc., Men's Underwear, Sweaters, etc.

New Improved Sleeve Machines, Machines for Rib Hosiery, Rib Tops and Cuffs.

LATEST IMPROVEMENTS ON ALL MACHINES.

MECHANICAL STOP MOTIONS

For Circular Rib Knitting Machines.

OFFICE AND SHOW ROOMS:

606 ARCH STREET, PHILADELPHIA.

The "INVINCIBLE"

A machine of the highest grade.

Practical and Economical in operation.

A Big Producer.

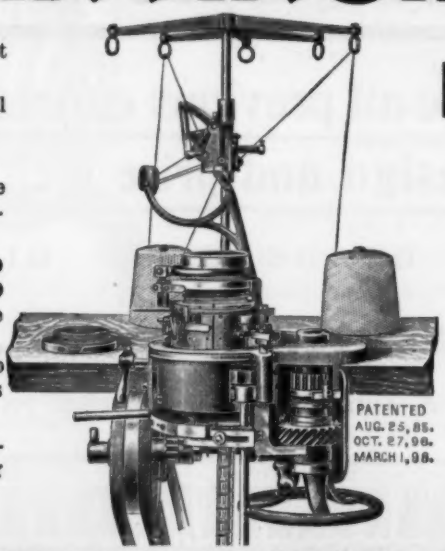
Gauge of machine changed by simple changing cylinders.

The Invincible METHOD OF TRANSFERRING RIBBED TOPS is quicker and more positive than others.

No experience required to transfer ribbed tops by this method.

YARN CHANGED automatically without revolving bobbins.

Write for Catalogue.



Full Automatic Knitting Machine

For all kinds and gauges of

SEAMLESS HOSIERY

PAWTUCKET, R.I. U. S. A.

E. JENCKES MFG. CO.

BRANCH OFFICE, Room 370, Bourse Bld'g, PHILADA, PA.

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CIRCULAR KNITTING MACHINES

Either plain or full automatic, with stop motions complete, for

Ribbed Underwear, Sweaters, Cardigans, Cuffs and Anklets.

The Leighton Circular Machines are the only ones which **Rack** or **Shog** the needles for fancy borders; also built for automatic striping; and with from 4 to 16 feeds for underwear.

Also Builders of ABEL WINDERS, SEAMERS and LOOPERS.

LEIGHTON MACHINE CO.,
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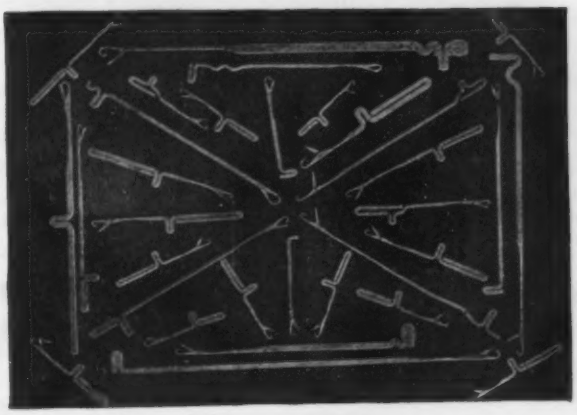
Latch Needles

For all Knitting Machines.



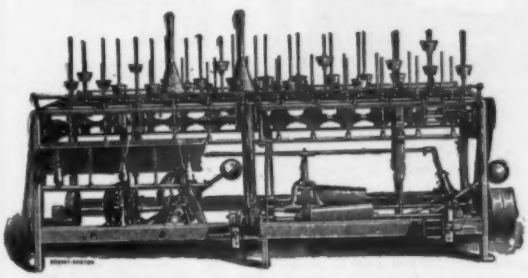
Our Superior or Sunken Rivet Head Needles

Will save you money every day in the year.

Dodge Needle Co., Manchester, N.H.

We now build, with or without differential motion, for winding on Bobbins from Skein or Cop,

THE ABEL WINDERS



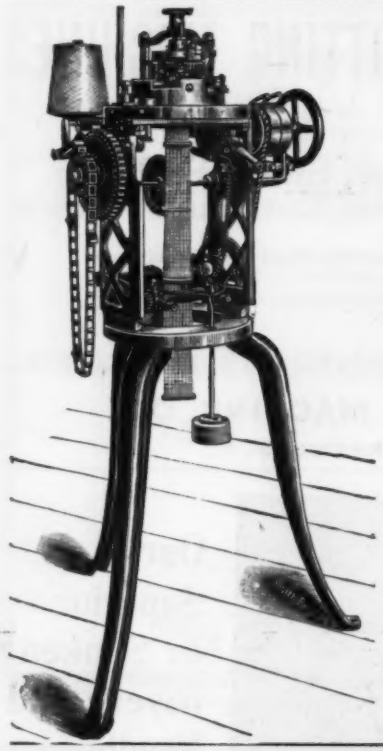
ALSO THE

Abel Seamers and Loopers

IN CONNECTION WITH OUR LINE OF

AUTOMATIC RIB KNITTING MACHINERY.

LEIGHTON MACHINE CO., Manchester, N. H.



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BUILDERS OF

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For HOSIERY and UNDERWEAR.

Complete Estimates Furnished. Send for Particulars.

The cut shows our **Improved Automatic Ribber** with Welt and Slack Course for Half Hose, Tops and Ribbed Legs.

Adams Rib and Top Cutting Machine

FULLY AUTOMATIC.

Cuts all Fabrics with or without Welts. Requires no trimming after passing through machne. Perfectly clean work.

Solidity.

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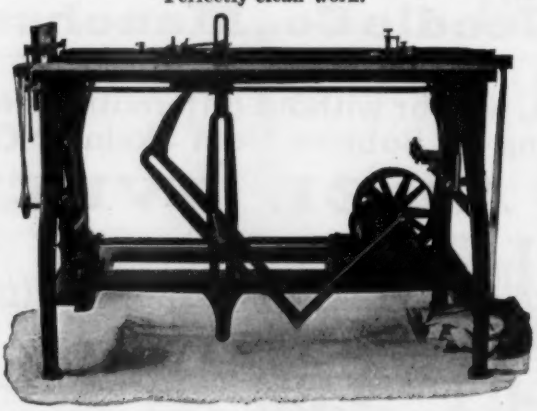
Absolute Positive Movements.

Best Materials.



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Easy Running.

False Welts cut out automatically. 1,500 dozen pairs, cut per day by one operator.
Saving of Labor and Goods. Can be operated by boy or girl. Accidents impossible. No Special Attachments. Patented in the U. S. A. and Europe.

Sole Manufacturers and Agents for the U. S. A.,

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THE CHEAPEST and BEST METHOD
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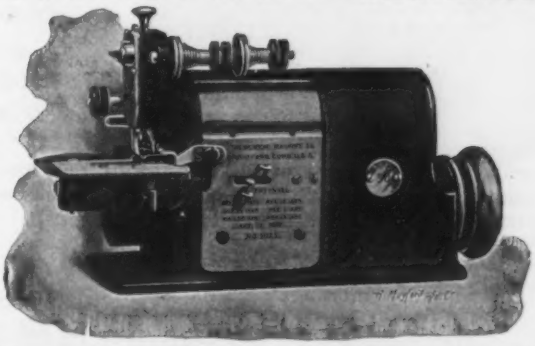
FINISHING RIBBED KNIT GOODS
IS BY THE USE OF
OUR HIGH SPEED MACHINES.



BLANKETS, SKIRTS or COTTON GOODS,
requiring a useful and Ornamental Finish, should be finished by some of our various machines adapted for special purposes and finishes.
Send for Catalogue and Samples, stating the kind of goods to be finished.

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FRED BAUMANN, Jr., Eastern Mgr., 467 Broadway, NEW YORK.

CUTTING MACHINES

Made to be operated by direct current, 110 or 220 volts.

What electric current have you?

UNIVERSAL CUTTER will do the work BETTER and cut a GREATER quantity of Knit Underwear, or Fleeced Materials, than any other Cutting Machine on the market. : : : :

Made in 3 sizes Circular Knives:—Gem, 3 1-4 inch Knife, weight 15 lbs.; Prima, 4 inch Knife, weight 24 lbs.; Giant, 5 1-2 inch Knife, weight 27 lbs. Two sizes straight or Reciprocating Knives. Send us sample of material you desire to cut, stating thickness you want to cut at one time, and we will advise you as to which size is best adapted to your wants.

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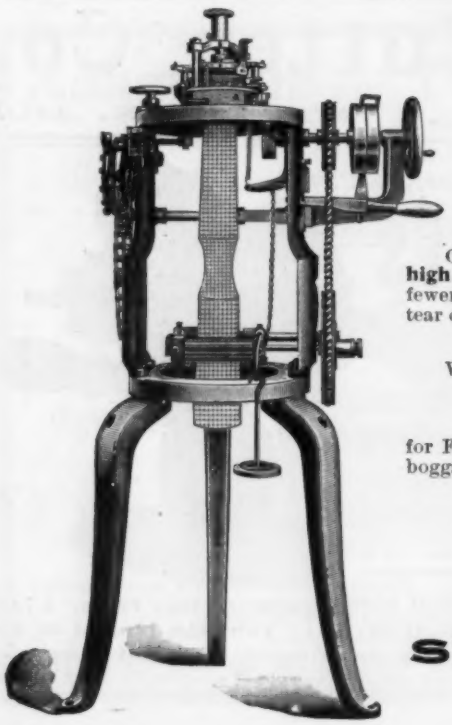

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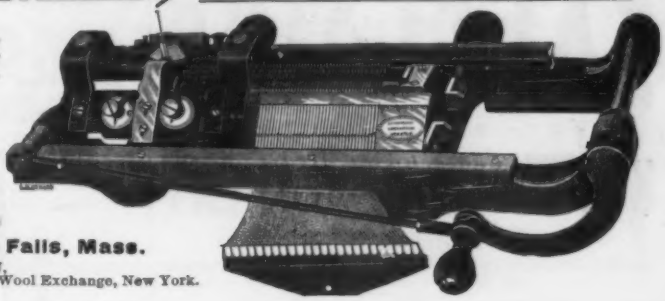

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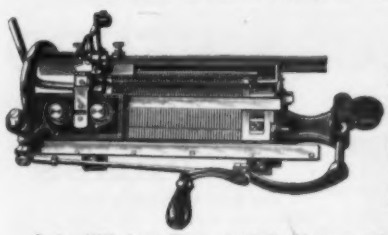

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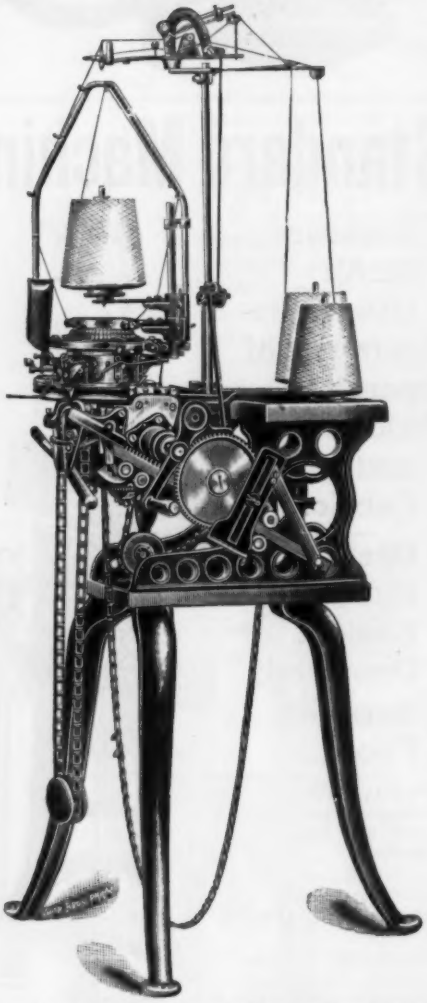

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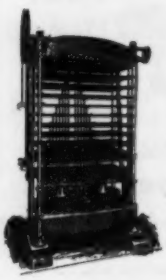

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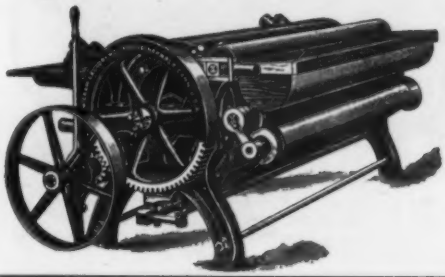

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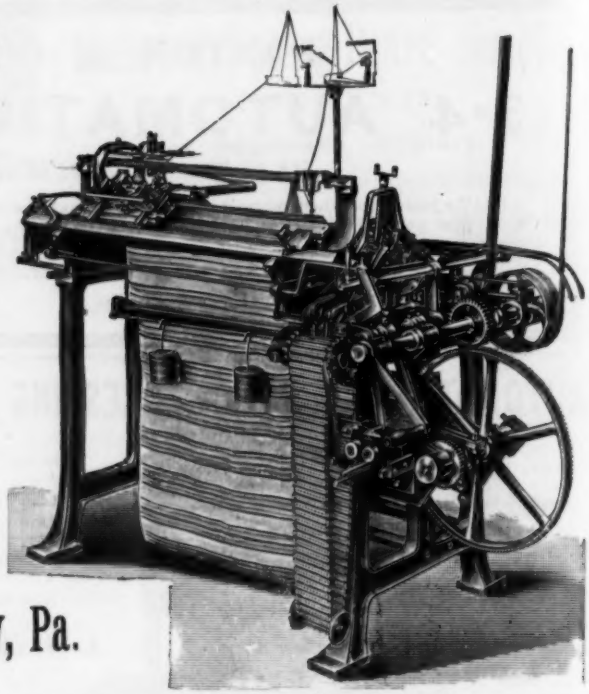

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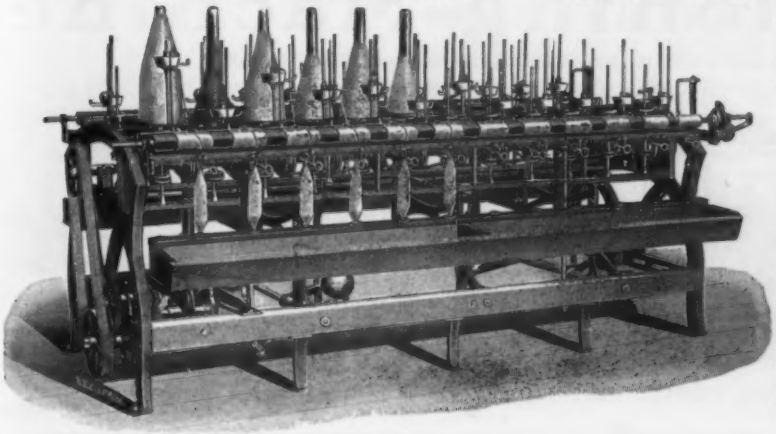

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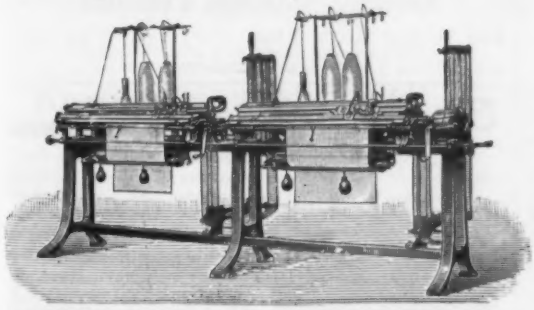

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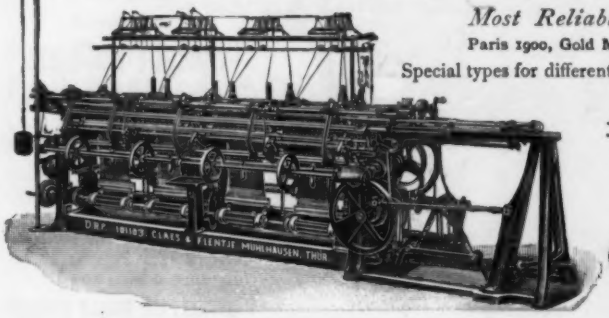

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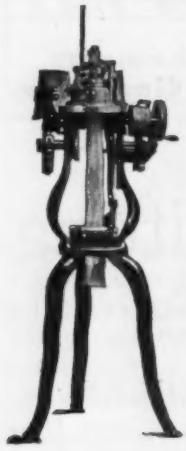

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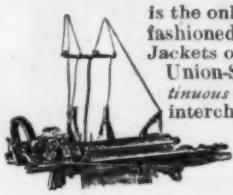

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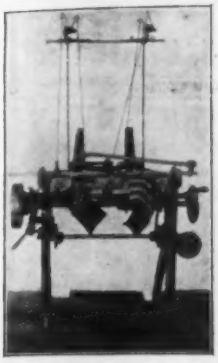

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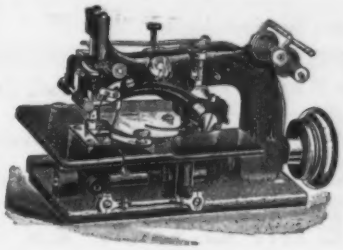

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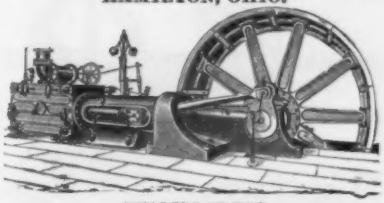

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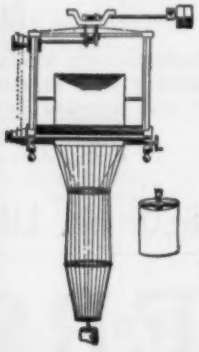

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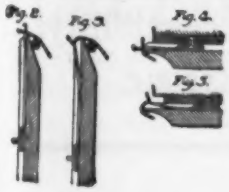

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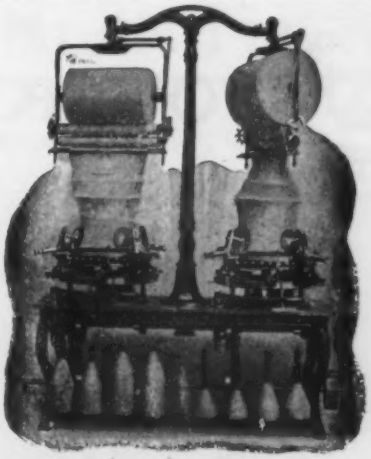

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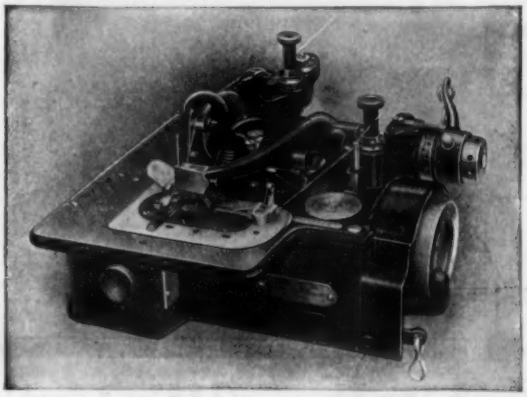
Patent twice upheld by the U. S. Court of Appeals.



For Trimming, Seaming (or Hemming, or Overedging) and Covering Raw Edges in One Operation of Knit Underwear and Hosiery; and for making Overlock Corded Edge on Woven Fabrics.

WARNING!

Manufacturers and dealers are warned that not only is the "Overlock" Machine fully protected by our four patents of April 5, 1892, and one of May 26, 1896, but the edging products are also protected by patents of March 10, 1896, and Dec. 26, 1899.

WILLCOX & GIBBS SEWING MACHINE CO.,

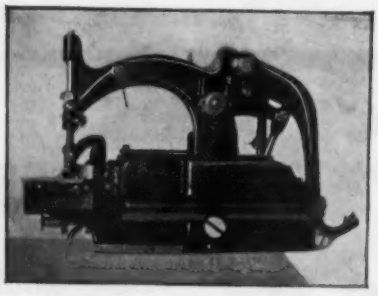
General Offices:

Nos. 85-87-89 Bleecker Street, near Broadway, NEW YORK, N. Y.

Also, LONDON.—PARIS.—DRESDEN.—MILAN.

The Arnold Sewing Machine Co.

216 High Street, NEWARK, New Jersey.



Overedge Welting Machine, ***with Trimmer.***

The very best in the market. (No royalty.)

Overedge Seaming Machine, ***with Trimmer.***

3000 stitches per minute. (No royalty.)

Overedge Sewing Machine, ***without Trimmer.***

For manufacturers of knit goods and other fabrics, with or without trimmers.

Our claims are Simplicity, Durability, Accessibility,

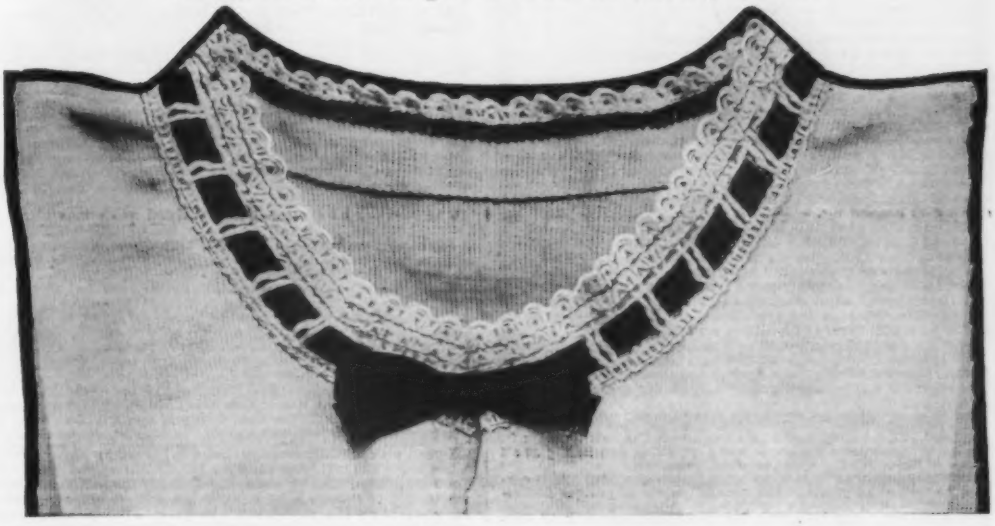
EVERY PART OF OUR MACHINE BEING READILY ACCESSIBLE.

This machine has 100 less parts than any other overedge machine.

Do you use this Collarette Finish?

Union Special Machine Style 12700

Stitches lace on opposite sides of ribbon and covers raw edge of web in one operation.



This is the only machine that will stitch the lace to the garment and position the cross bars of the lace. If you are not satisfied with your present methods and want to reduce cost, and at same time improve quality, write us for samples and information.

Union Special Sewing Machine Co.

CHICAGO. NEW YORK. PHILADELPHIA. BOSTON. AMSTERDAM, N. Y. COHOES, N. Y. ST. LOUIS. CINCINNATI.

WILFRED WELLS,

Sole Manufacturer of the

CHAMPION HOSIERY STAMP.

PATENTED JANUARY 7, 1896.

The Only Perfect Stamp for Hosiery, Underwear and all Woven Fabrics. BLOCKS FOR PRINTING HOSIERY.

505 W. Lehigh Avenue, . . . PHILADELPHIA, PA.

LACINGS FOR OVERSHIRTS and UNDERWEAR.

Tipped and Tasseled.

Hepner & Horwitz, 30 Howard St., N. Y.

CELEBRATED BRAND PYRAMID TRADE MARK **LACINGS**

For Underwear, Overshirts and Sweaters,

JOHN CATHCART & CO.,

115 Franklin Street, NEW YORK.

Perfect Fast Black for Hosiery

The "Dubois' Sanitary" Oxidized Fast Black Dyeing Process with the Lisle Thread Silk Finish, Patented March 17, 1903, and The "Dubois Sanitary" One Dip Fast Black in Powder Form, Leads Them All!

This is the most reliable dyeing formula known to fast black dyers. It has been adopted successfully by many leading mills. It always gives uniform shade, oxidizes well and the fabric is almost as strong as though dyed with direct colors. Most important of all, it gives a fine lisle thread finish without in the least tendering the goods. Beware of cheap fast black formulas, which are sure to be dearer in the end.

The cost of the Dubois black, the best in the market, is very reasonable, as low as $1.40 per 100 pounds dyed in ordinary black for cheap trade, and not over $2.50 per 100 for the very best black for high grade goods, guaranteed to be ungreenable to acid tests and wear. Manufacturers of knit goods, hosiery and job dyers ***take notice*** that I am prepared to give licenses with full instructions for producing lisle thread finish (processes patented March, 1903) on any kind of direct colors or fast black, either before or after dyeing or bleaching.

Sulphur and diamine blacks particularly are so much improved after having been lisled by my patented process that they look just as well as aniline oxidized fast black, and yarn costing 17 1-2 cents per pound will produce as fine a looking fabric treated by my process as the genuine lisle thread at a cost of 34 cents per pound. This is a boon for direct color job dyers and bleachers, as well as for manufacturers of hosiery and knit goods.

The license will be given on a small royalty per 100 pounds.

All the machines used for the fast black and lisle thread finish, also for giving lisle thread finish to direct colors on bleached or unbleached goods are of my own invention, and are

PATENTED AS FOLLOWS:

June 18, 1901. Rotary oxidizing apparatus. The only machine in the world that carries the goods while oxidizing and lisling at all points of the compass. Quickest oxidizer known.

September 9, 1902. Rotary yarn oxidizing apparatus. Also carries the yarn at all points of the compass while in process of oxidizing or steaming.

June 10, 1902. A stationary hosiery oxidizing apparatus. Two different speeds. Especially constructed for lisle thread finish on hosiery or knit goods, equipped with an electric thermometer for the accurate measurement of the dry and wet hot air.

December 10, 1900. Stationary hosiery oxidizing apparatus. Two speeds. Chain and sprocket wheel drive with double clutch to start and stop. Very strong for heavy work, also built for lisle thread finish.

ALSO NOTICE:—That My One Dip Sanitary Fast Black in Powder Form is the same black as the Sanitary Oxidize Fast Black Process mentioned at the head of this advertisement, and is a long felt want among the trade, particularly for small concerns whose production would not warrant the equipping of an Oxidize Fast Black Dyeing plant.

This One Dip Sanitary Fast Black is dyed in the open ordinary dye tub at boiling heat in one hour, then washed and softened, if desired, as is done with all other direct colors for cotton hosiery, and has the advantage on the other direct blacks to allow the production of any shade desired from a jet to a very blue black, and matching well the oxidized aniline black.

The cost per 100 pounds hosiery dyed with this black is from $3.50 to $5.80 according to amount of softener used.

This One Dip Sanitary Black is positively guaranteed to be ungreenable to acid test and wear and leave the fabrics as strong after dyeing as it was in the white.

The apparatus required to start dyeing are but two ordinary wood dyer's tubs and one hydro-extractor.

Those wishing to put on their goods so dyed my "Lisle Thread Finish" (Patented) can do so by simply adding to above apparatus one or more of my "Stationary Oxidizing Machines" (Patented June 10, 1902), and take out a license for the use of my patent for lisle thread finish on vegetable fabrics, which will be given free of charge, and all you will have to pay for the use of the machine and the lisle thread finish process, will be but a small royalty for each 100 pounds hosiery given the lisle thread finish.

Dyers and manufacturers that are far away may procure a license with full instructions for building the machines economically, paying a small royalty for the use. I have made the royalties low, so that ***no one may be debarred by reason of the price,*** but I mean to protect my patents and will vigorously prosecute any who infringe.

Fast black dye and bleach plants for hosiery, underwear and skein fast black yarn dyeing, installed and equipped complete, if desired. Apply to

A. N. DUBOIS, 2170 Sedgeley Ave., Phila., Pa.

or

KEYSTONE LAW and PATENT CO., Betz Bldg., So. Broad and Market Sts., Phila., Pa.

HANDY.

NON-SPILLABLE.

THE subject of BELT DRESSING is not too trivial for the Buyer who wishes to run his mill to its full capacity for the least expense.

Time of idle hands is money.

Spoiled product is money lost.

In buying Stephenson Belt Dressing you are insured against further shut-downs to take up slack belts.

Its many good qualities can only be appreciated by its use.

May we have your next **trial** order, or shall we send you you a free sample by mail?

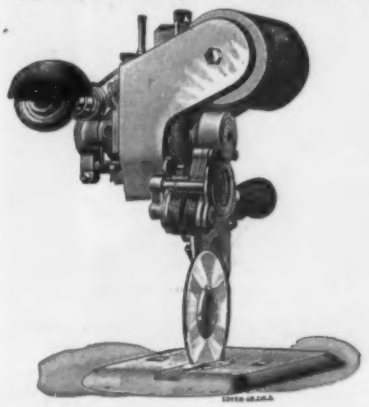
STEPHENSON MFG. CO., - Albany, N. Y.

The "STAR" CUTTER

Shown below is especially adapted

For Knitting Mills.

Cuts Any Shape and Many Thicknesses of Fabrics.



Has ball bearings; requires but 1-6 horse power; uses direct current; patent flexible take-up device. Acceptable to insurance underwriters. Repairs almost nothing. Now in use by a number of first-class knitting mills, to whom reference can be made.

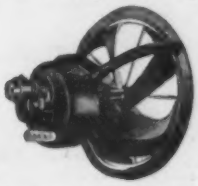
WOLF ELECTRICAL PROMOTING CO.,

810 Main Street, - - Cincinnati, Ohio.

"DAVIDSON"

Electric Ventilating FANS

For Every Purpose



Direct and Alternating Current Outfits

Bulletin No. 168-A tells all about them

Massachusetts Fan Co.

Waltham, Mass.

The American Knitting Industry in 1903

¶ THE AMERICAN DIRECTORY OF THE KNITTING TRADE IN THE UNITED STATES, CANADA AND MEXICO FOR 1903 will be sent to any address on receipt of the price, $2.00. *Contains a List of the New Mills—corrected up to date.* Has flexible covers so that it may be carried comfortably in the pocket. *It is of incalculable value to manufacturers of Machinery or Supplies catering to the Knitting Trade.* : : : : : : : : :

Published by

LORD & NAGLE COMPANY

PHILADELPHIA, PA. .. .. BOSTON, MASS.

Boston Wool Exhausters, with Removable Tops.

As used in Connection with Pneumatic Conveyer System for Handling Wool, Cotton, Rags, Excelsior, Jute, etc.

Inlet Side of Right-hand Wool Exhauster. **Pulley Side of Left-hand Wool Exhauster.**

This machine is similar in design to the regular Boston Patent Exhaust Fan, but is fitted with a special wheel for handling fibrous materials, and the top is removable.

This latter feature is especially desirable when handling wet or greasy materials or in handling anything, in fact, which would leave a deposit on the inside of fan, as the entire top may readily be removed for inspection or cleaning without disconnecting either pipe or belt connections.

BOSTON BLOWER CO., Main Office and Works: **Business and Glenwood Sts., HYDE PARK, MASS.**

WATER WHEELS

FOR ALL HEADS FROM 3 FEET TO 2000 FEET.

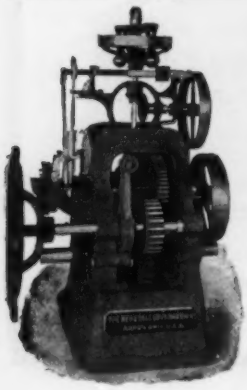
Adapted to all **POWER** Purposes. Easy working balanced gates. We guarantee greatest power with smallest quantity of water, at both full and part gates.

State Head and Power Required.

AUTOMATIC ENGINES

10 to 50 H.P., guaranteeing best possible regulation with highest economy in steam. Pamphlet of either Wheel or Engine sent on application.

JAMES LEFFEL & CO., Springfield, Ohio, U. S. A.



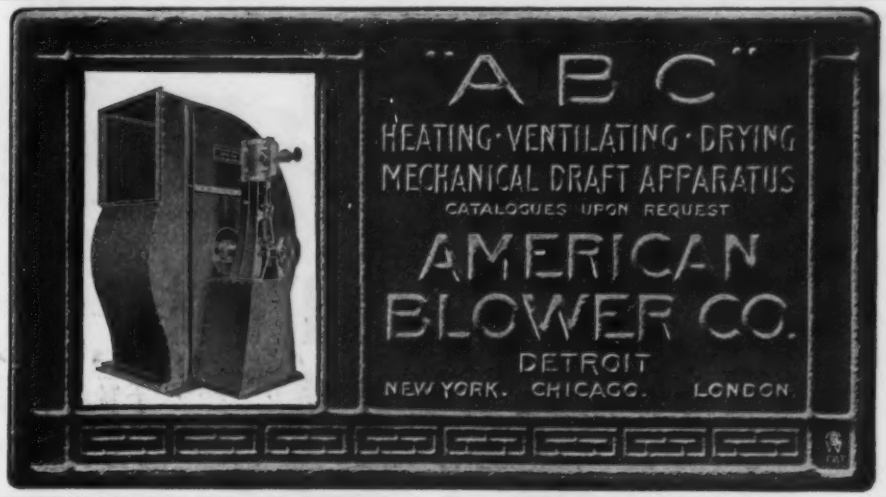
WATERWHEEL GOVERNORS

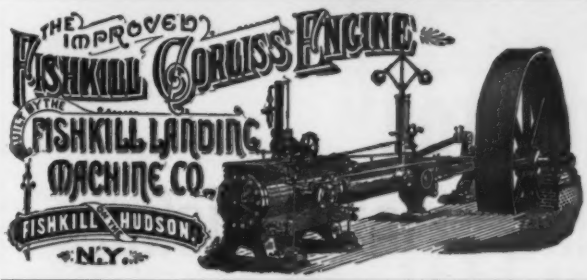
FOR TEXTILE MILLS
Electric Light, Power and Railroad Work

We are now prepared to **guarantee absolute satisfaction.** Write for references in your locatity.

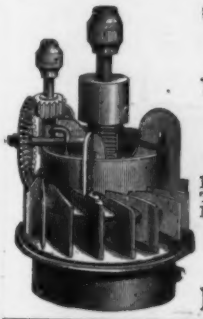
THE REPLOGLE GOVERNOR WORKS

Broadway and Chestnut Streets, **AKRON, OHIO.**





UNRIVALED AS THE MOST
Efficient, Durable and Economical power extant.
For Close Regulation and Noiseless Operation it has NO EQUAL.



TURBINES ON HORIZONTAL AND VERTICAL SHAFTS.

These wheels are specially designed and adapted to **TEXTILE MILLS**

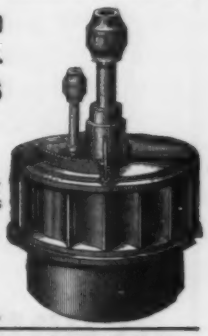
The records of the Risdon Wheel are not equaled by the records of any other wheel. Average of results of tests in Holyoke Flume: Full Gate, .8694; Seven-eight, .8472; Three-quarter, .8014; Five-eighth, .7601.

RISDON CELEBRTAED TURBINES. ALCOTT HIGH DUTY TURBINE. Unequalled Efficiency. Easy Working Gate. Greatest Power from a Limited Quantity of Water at Smallest Cost.

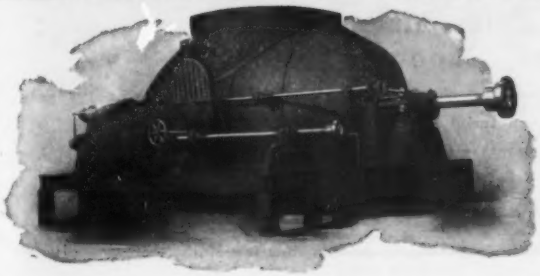
TAYLOR SLEEVE GATE TURBINE. The largest power ever obtained from a Wheel of the same diameter.

SEND FOR CATALOGUE.

RISDON-ALCOTT TURBINE CO. Mount Holly, New Jersey, U.S.A.



PAIR McCORMICK TURBINES

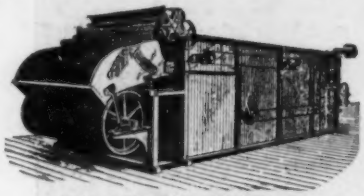


4,000 H.P., 85 ft. head, arranged to drive generator and a single turbine to drive exciter. Five settings built for the Hudson River Water Power Company's Spier Falls plant and 14 pairs 51 inch for their plant at Mechanicsville, N, Y.

Write for Catalogue if contemplating purchase of turbines.

S. MORGAN SMITH CO.
YORK, PA.
Boston Office, 176 Federal Street.

AUG 14 1903

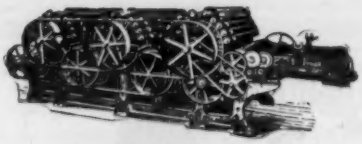


Automatic Cotton Stock Dryer.

Automatic Yarn Dryer.

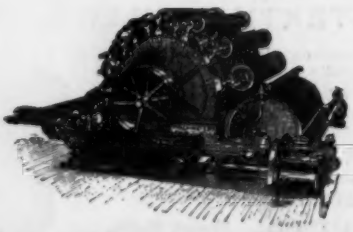
"CYCLONE" DRYERS

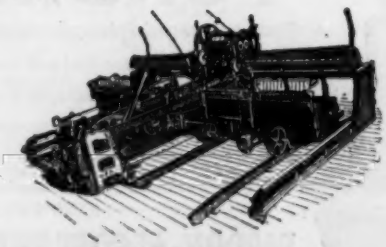
For Cotton Stock, Wool Stock, Rags,
Yarn, Cloth, Underwear, Stockings, Etc.



"PROCTOR"
Garnett Machines and Pickers

For reducing to fibre Cotton and Woolen
Waste, Cloth Clippings, Etc.





"FURBUSH" Woolen Mill Machinery

Including Pickers, Cards, Mules, Twisters,
Warpers, Dressers, Spoolers, Etc.

Manufactured by

THE PHILADELPHIA TEXTILE MACHINERY CO.,
Hancock and Somerset Sts., - PHILADELPHIA, PA.

The Textile-Finishing Machinery Co.

17 EXCHANGE PLACE, PROVIDENCE, R. I.

Mercerizing Machinery for Piece Goods and Yarn in the warp or chain

Singeing Machines,

Boiling Kiers,

Washers, Squeezers,

Chemic and Sour

Rusden Patent

Continuous Chainless

Steamer,

Aniline Agers,

Dyeing Machines,

Open Soapers,

Blanket Washers,

Color Kettles,

Horizontal or Vertical Drying Machines, with Copper or Tinned Iron Cylinders,

Automatic Tentering Machines,

Water and Starch Mangles,

Dampening Machines,

Dyeing Machines for Chain Warps.

BUILDERS OF ALL KINDS OF

MACHINERY

FOR

BLEACHING

DYEING

DRYING

AND

FINISHING

Calenders for Rolling, Glazing, Chasing and Embossing, also Calenders for Moire Finish.

Patent Combination Rolls made of Cotton and Husk especially adapted for Soft Finish, Unequalled for Elasticity and Durability.

Cotton, Paper, Husk, Chilled Iron, Brass and Rubber Rolls, Electro-deposited Copper Rolls for all Purposes.

Padding and Drying Machines for Shade Cloths.

Single and Double Cylinder Engines.

Hydraulic Presses and Pumps.

ALL KINDS OF OUTFITS FOR BLEACHING THREAD AND SOFT TWISTED YARN.
BLEACHING MACHINERY FOR YARNS IN THE WARP OR CHAIN.

Estimates, drawings and full particulars of complete plants furnished on application

SEE INSIDE FRONT COVER PAGE

JAMES SMITH WOOLEN MACHINERY CO.

411 to 421 Race Street, Philadelphia.

Woolen Machinery

FOR

Carding, Spinning, Wool Washing, Carnetting, Pickering, Drying, Burring, Cleaning, Finishing.

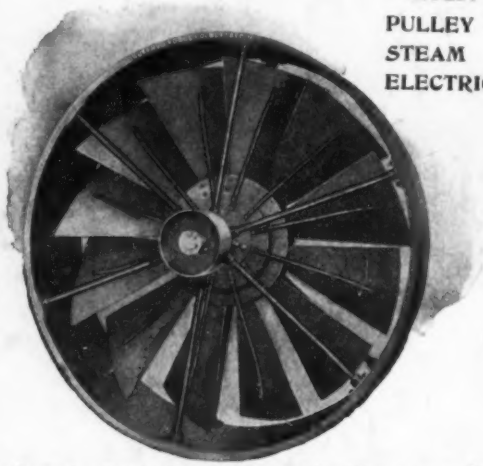
Cotton Batting and Waste Machinery.

FOR MORE COMPLETE LINE SEE PAGE 59.

BUFFALO DISK WHEELS

For Cooling, Ventilating, Drying

TYPES:
PULLEY
STEAM
ELECTRIC



For Removing Steam from Slashers and Dye-Houses as well as all offensive odors common to dying processes. They are largely and successfully employed in cotton-linen and woolen mills for such purposes as well as for preventing harmful condensation of steam in the room.

BUFFALO FORGE COMPANY, Buffalo, N. Y.

NEW FOSTER CONE.

Open wind from start to finish of Cone.

No press-offs from knots, over-winds, etc.

The only perfect system of winding yarn for knitting purposes.

Over 30,000 spindles in use in the U. S.

FOSTER MACHINE CO.,
Westfield, Mass.

Walworth Manufacturing Co.,

HIGH PRESSURE

VALVES AND FITTINGS

"Walmanco" Pipe Flanges,
"Never Stick" Blow-off Cocks, Mill Supplies.

GENERAL OFFICES:

132 FEDERAL STREET, BOSTON, MASS.

New York Office: Park Row Building.